Name: _____ Student ID: _____

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 18 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

____ I will complete this MiniExam solely using my own work.
____ I will not use any digital resources unless explicitly allowed by the instructor.
____ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

_____ = _____ + _____ × _____ + _____

b) Based on the information given, what would β_0 equal? β_0 = _____

c) Based on the information given, what would β_1 equal? β_1 = _____

d) What is the default null hypothesis for β_1? _____

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

a) Write down a statistical model to test this question.

_____ = _____ + _____ × _____ + _____

b) What part of your statistical model would indicate that temperature affects sales?

c) Sketch (*to the right* ->) how you would visualize this model.

Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

_____ = _____ + _____ × _____ + _____

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.

b) Interpret the Intercept coefficient (45.20) in context:

c) Interpret the coefficient on `graduate_degree` (18.50) in context:

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

□ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
□ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
□ Only 0.1% of the income difference between groups is due to random chance
□ There's a 99.9% probability that the true coefficient is at least 18.5
□ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Kurt Habazin Student ID: 3608342

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

KH I will complete this MiniExam solely using my own work.
KH I will not use any digital resources unless explicitly allowed by the instructor.
KH I will not communicate directly or indirectly with others during the MiniExam.

$y = mx + b$

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

82 78

a) If we code remote as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity score = β_0 + β_1 × remote workers + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 82

d) What is the default null hypothesis for β_1? 4

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

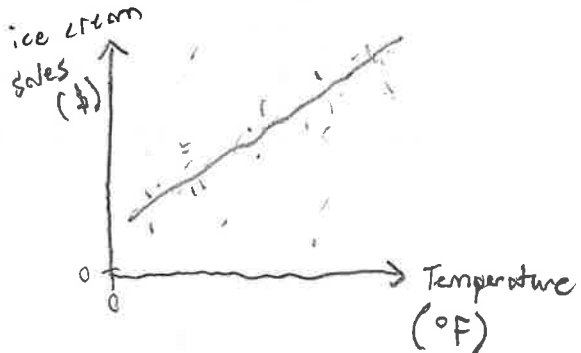
a) Write down a statistical model to test this question.

Ice cream sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

Slope,

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

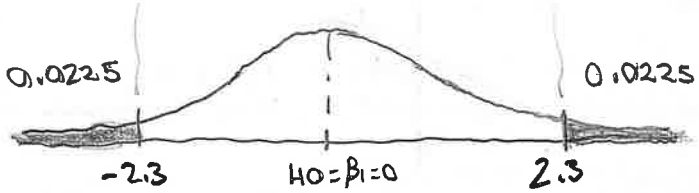
a) Write down a statistical model to test this relationship.

hourly wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

hourly wages increase by 0.85 for every additional unit of age.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

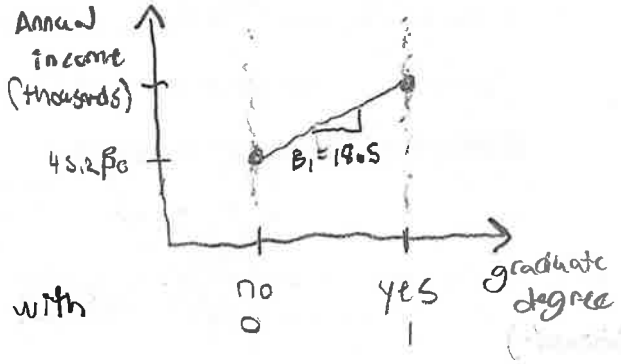


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

A person w/o a graduate degree earns $45,200 average annual income.

c) Interpret the coefficient on graduate_degree (18.50) in context:

Average annual income increases by $18,500 with a graduates degree.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- □ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- □ Only 0.1% of the income difference between groups is due to random chance
- □ There's a 99.9% probability that the true coefficient is at least 18.5
- □ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: James Sampayano Student ID: 4569386

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

J I will complete this MiniExam solely using my own work.
J I will not use any digital resources unless explicitly allowed by the instructor.
J I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

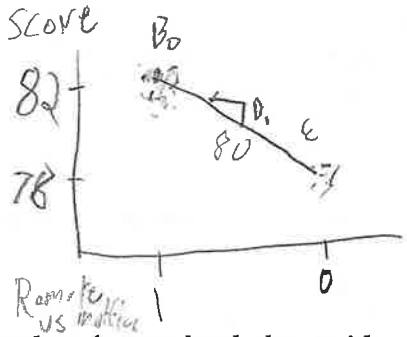
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

1 = β_0 + β_1 × 0 + ε

b) Based on the information given, what would β_0 equal? β_0 = 82

c) Based on the information given, what would β_1 equal? β_1 = -2

d) What is the default null hypothesis for β_1? correct/correlation



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

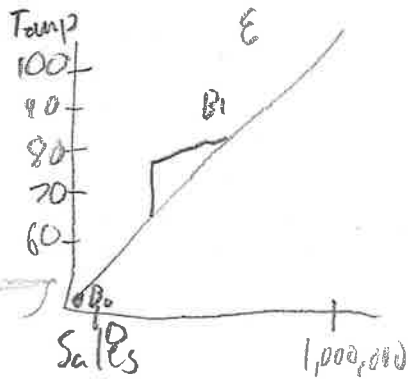
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

A larger β_1 or slope would indicate relationship

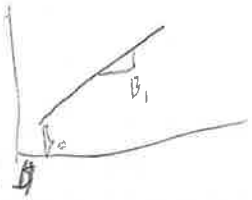
c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

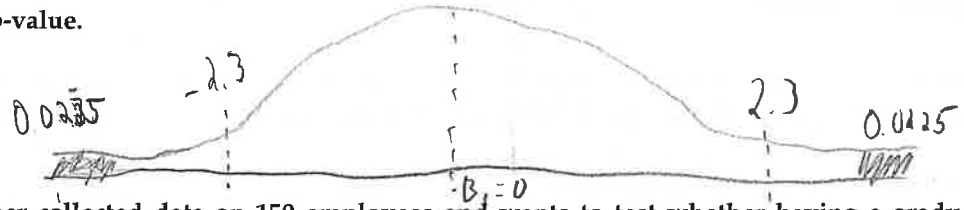
hourly wages = β_0 + β_1 × age + ϵ



b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

there is a relation between age and hourly wage, and it is positive, meaning older = more $

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

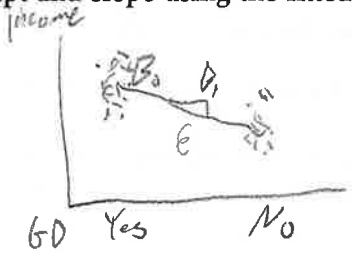


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Employees with grad degrees make $45.20 more annually

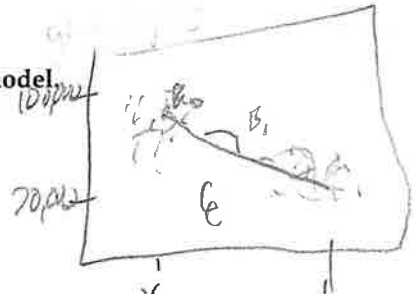
c) Interpret the coefficient on graduate_degree (18.50) in context:

18.5 less employees have grad degrees

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☐ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☑ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Abaar Mostafa Student ID: 463720

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

X I will complete this MiniExam solely using my own work.
X I will not use any digital resources unless explicitly allowed by the instructor.
X I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity score = β_0 + β_1 × remote vs in office + ε_0

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

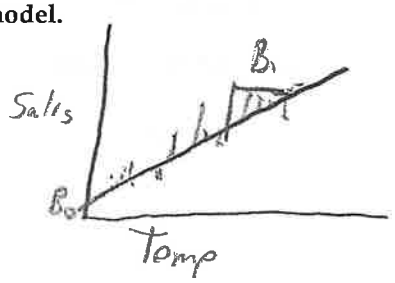
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temperature + ε_0

b) What part of your statistical model would indicate that temperature affects sales?

β_1 slope; if it does not equal zero; $\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts `hourly_wages` using a sample of n=250 workers.

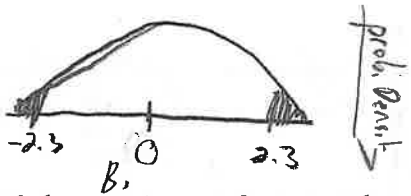
a) Write down a statistical model to test this relationship.

hourly_wages = β_0 + β_1 × age + ε_i

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

for every 1 year increase in age, hourly wage increases by 0.85.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.



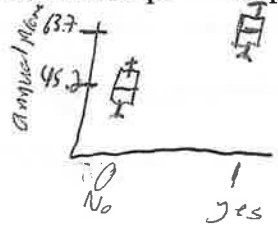
Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

63.7

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

The avg salary for someone without a graduates Degree is 45.2.

c) Interpret the coefficient on `graduate_degree` (18.50) in context:

The avg salary for someone with a graduates degree is 18.50 more than that for someone with a graduates degree.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Darren Lee Student ID: 4746297

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

X I will complete this MiniExam solely using my own work.
X I will not use any digital resources unless explicitly allowed by the instructor.
X I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Prod. Scores = β_0 + β_1 × Office Location + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? _____

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

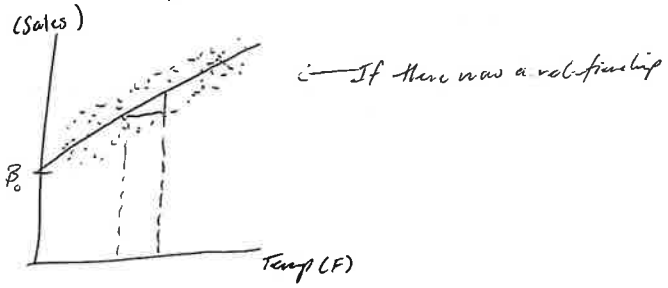
a) Write down a statistical model to test this question.

Sales(i) = β_0 + β_1 × temperature (F) + ε

b) What part of your statistical model would indicate that temperature affects sales?

If the p value of the slope is less than the generally accepted level of α(alpha) of 0.05

c) Sketch (*to the right* ->) how you would visualize this model.



← If there was a relationship

Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

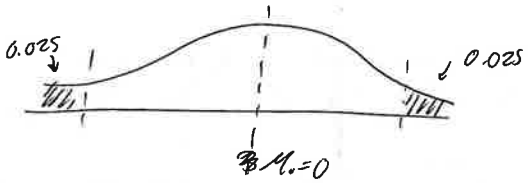
a) Write down a statistical model to test this relationship.

Hourly_wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

With every year that your age increases, it results in an average increase of 0.85 in your wage.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.



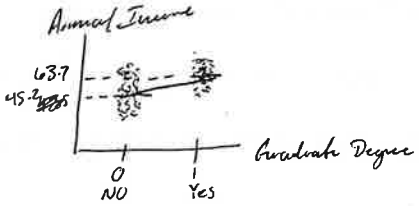
Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

63.7

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Assuming you don't have a graduate degree, your average income according to the sample mean is 45.2.

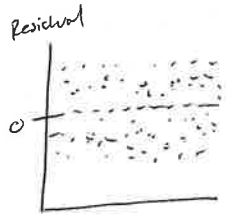
c) Interpret the coefficient on graduate_degree (18.50) in context:

Assuming you've attained a graduate degree, this, on average, increases your average income by 18.5 units of average income

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Eleen Hn Student ID: 46410449

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity score = β_0 + β_1 × remote + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

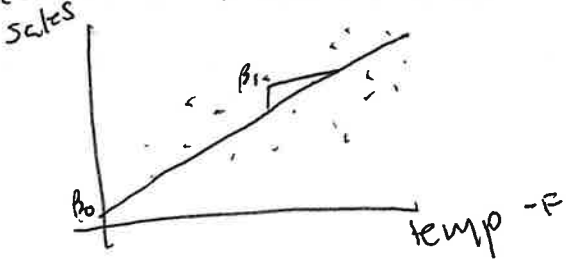
a) Write down a statistical model to test this question.

icecream sales = β_0 + β_1 × temp °F + ε

b) What part of your statistical model would indicate that temperature affects sales?

β_1 → if $\beta_1 \neq 0$, indicates temperature & sales have relationship

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

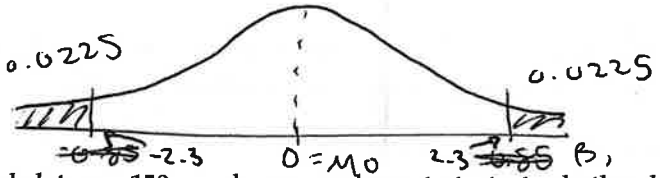
a) Write down a statistical model to test this relationship.

hourly wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

hourly wages increase by 0.85 for each additional yr of age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

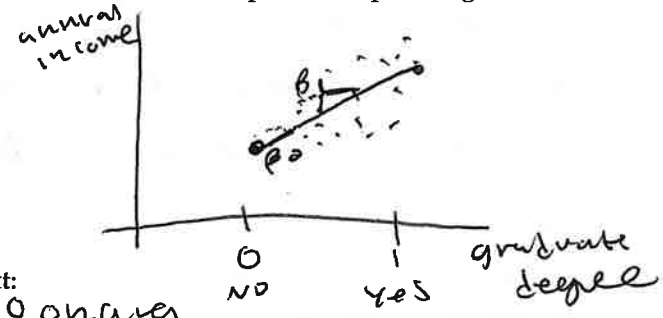


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

annual income for someone w/no graduate degree is 45.20

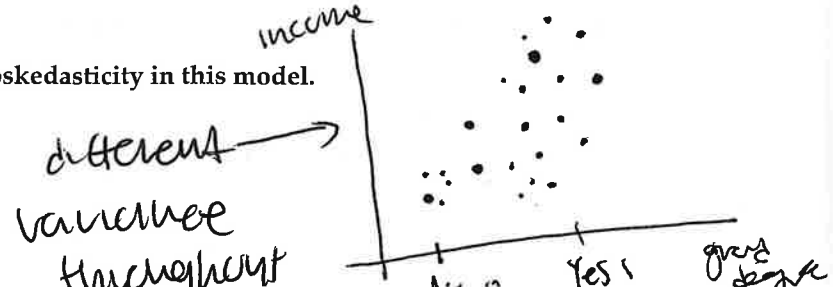
c) Interpret the coefficient on graduate_degree (18.50) in context:

annual income increases by 18.50 on avg w/ a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Xifan Zheng Student ID: 4681906

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × remote + ~~in-office~~ coef

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 82$

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temperature coef

b) What part of your statistical model would indicate that temperature affects sales?

c) Sketch (*to the right* ->) how you would visualize this model.

Q3. You want to examine whether age predicts `hourly_wages` using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

Hourly wage = β0 + β1 × age + coef

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.

b) Interpret the Intercept coefficient (45.20) in context:

c) Interpret the coefficient on `graduate_degree` (18.50) in context:

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

□ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
□ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
☑ Only 0.1% of the income difference between groups is due to random chance
□ There's a 99.9% probability that the true coefficient is at least 18.5
□ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Ruixuan Li Student ID: 4681348

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

$Productivity = \beta_0 + \beta_1 \times Remote_i + \varepsilon_i$

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 82 - 78 = 4$

d) What is the default null hypothesis for β_1? $H_0: \beta_1 = 0$

∵ remote work doesn't affect productivity.

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

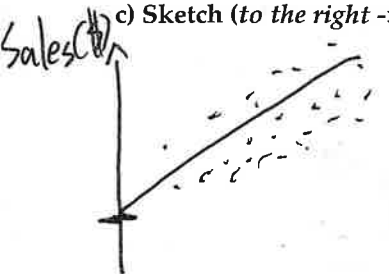
a) Write down a statistical model to test this question.

$Sales = \beta_0 + \beta_1 \times Temperature_{(i)} + \varepsilon_i$

b) What part of your statistical model would indicate that temperature affects sales?

The coefficient β_1, if $\beta_1 \neq 0$, temperature has an effect on sales.

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

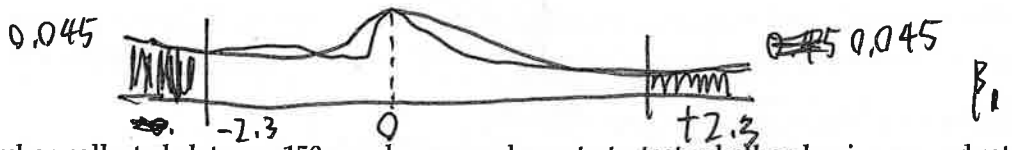
a) Write down a statistical model to test this relationship.

hourly_wages = β_0 + β_1 × age$_i$ + ε_i

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

For each additional year of age, the employee's hourly wages is predicted to increase by 0.85$ per hour, on average.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

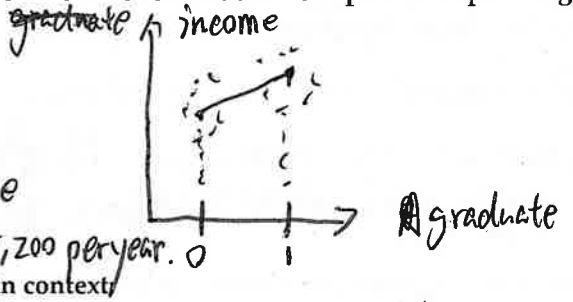


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Employees without a graduate degree are predicted to earn 45,200 per year.

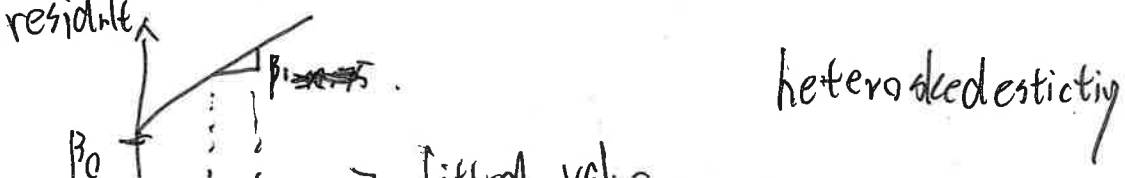
c) Interpret the coefficient on graduate_degree (18.50) in context:

Employees with a graduate degree earn, on average, 18,500$ more per year

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

□ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
□ Only 0.1% of the income difference between groups is due to random chance
□ There's a 99.9% probability that the true coefficient is at least 18.5
□ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Jason Perillo Student ID: 4713813

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

JP I will complete this MiniExam solely using my own work.
JP I will not use any digital resources unless explicitly allowed by the instructor.
JP I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × remote + ε_i

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

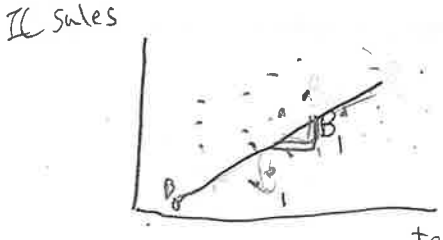
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temp + ε_i

b) What part of your statistical model would indicate that temperature affects sales?

The coefficient β_1

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts `hourly_wages` using a sample of n=250 workers.

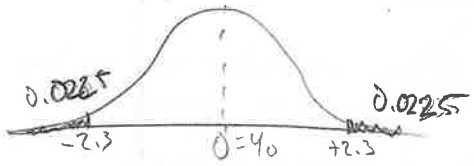
a) Write down a statistical model to test this relationship.

hourly wages = β_0 + β_1 × age + ε_i

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

hourly wages increase by 0.85 for every increase in age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

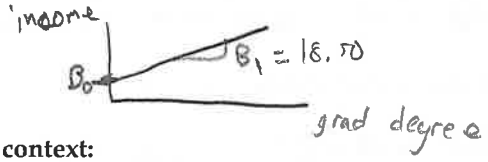


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

annual income with no degree is 45.20

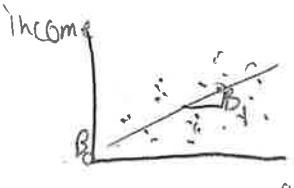
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

income increases by 18.50 for every increase in grad degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Christian Ercole Student ID: 4717 326

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

CE I will complete this MiniExam solely using my own work.
CE I will not use any digital resources unless explicitly allowed by the instructor.
CE I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity scores = β_0 + β_1 × workers + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 11 82 − 71

d) What is the default null hypothesis for β_1? 82

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

a) Write down a statistical model to test this question.

ice cream sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

β_1

c) Sketch (*to the right* ->) how you would visualize this model.

Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

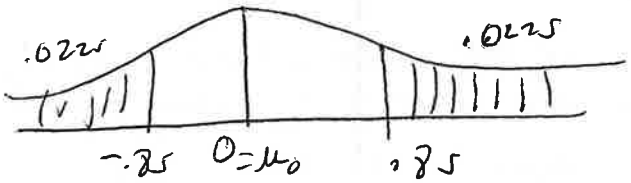
a) Write down a statistical model to test this relationship.

wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Wages increase .85 for every 1 year you age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

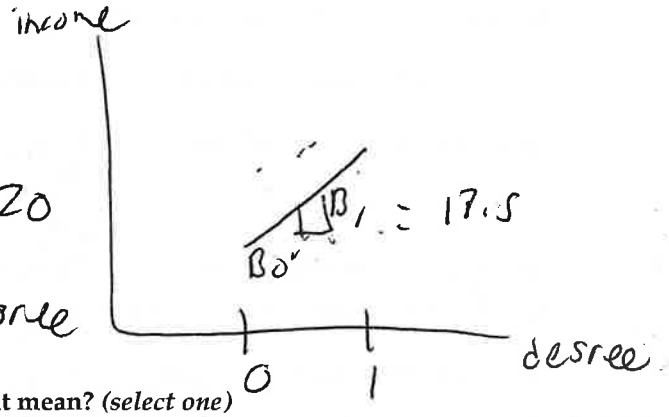


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Income for people without a degree is 45.20

c) Interpret the coefficient on `graduate_degree` (18.50) in context:

income ↑ 18.50 for people with a degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ● If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Sofia Heimel Student ID: 4714846

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

SH I will complete this MiniExam solely using my own work.
SH I will not use any digital resources unless explicitly allowed by the instructor.
SH I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Prod. Score = β_0 + β_1 × Remote + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 0.78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 0.82 - 0.78 = 0.4$ $\beta_1 = 0.4$

d) What is the default null hypothesis for β_1? $\beta_1 \leq .40$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

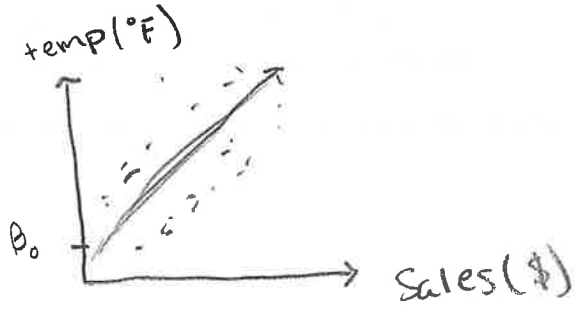
a) Write down a statistical model to test this question.

temp = β_0 + sales × β_1 + ε

b) What part of your statistical model would indicate that temperature affects sales?

β_1

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

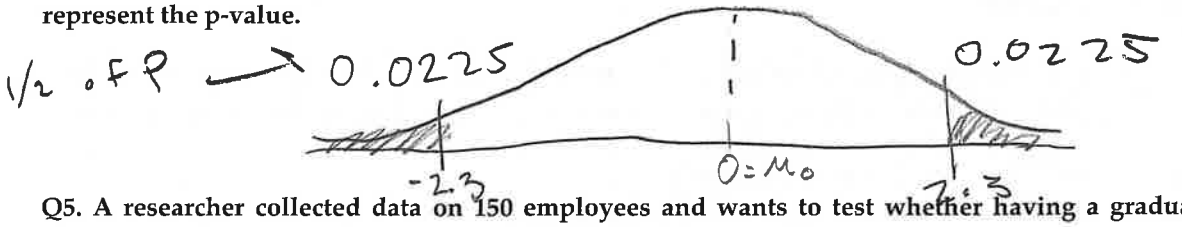
a) Write down a statistical model to test this relationship.

wage = β_0 + Age × β_1 + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

wages increase by 0.85 for each 1yr increase in age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

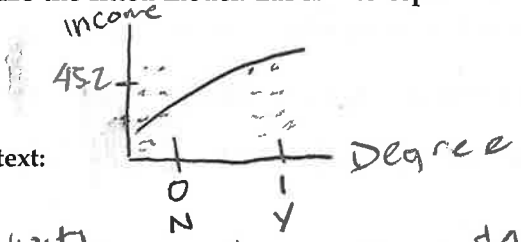


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

annual income for employees with no degree is $45,200

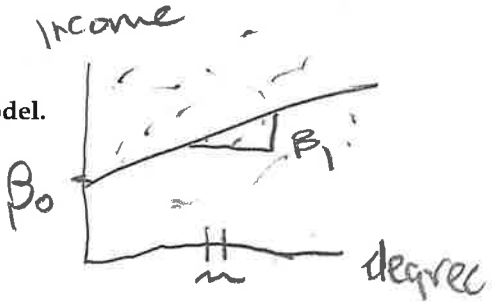
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

Salary/income increases by $18,500 for degreed employees

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Madeline Karpas Student ID: 4730220

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

MK I will complete this MiniExam solely using my own work.
MK I will not use any digital resources unless explicitly allowed by the instructor.
MK I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

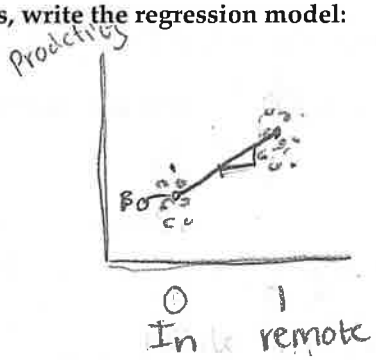
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity = β_0 + β_1 × in/remote office + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 82

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4 (82 − 78 =)

d) What is the default null hypothesis for β_1? 0



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

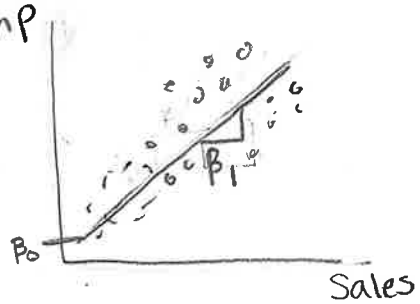
a) Write down a statistical model to test this question.

temp = β_1 + β_0 × sales + ε

b) What part of your statistical model would indicate that temperature affects sales?

The p-value would either indicate that there temp is or isn't a relationship

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

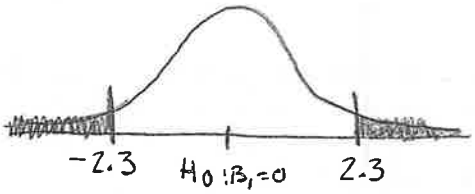
a) Write down a statistical model to test this relationship.

wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Wages would increase by 0.85 for every one year older.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

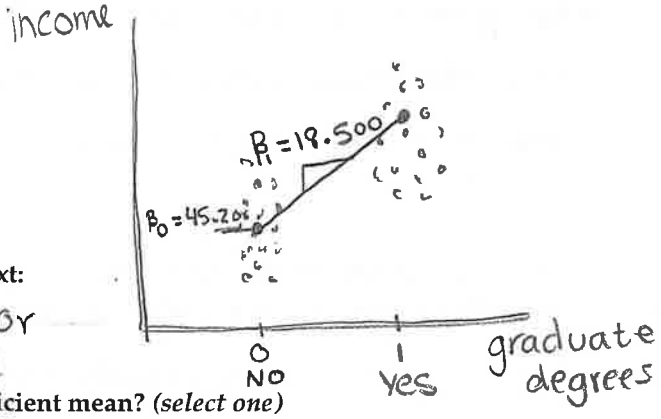


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

annual income for workers with no experiance is 45.200

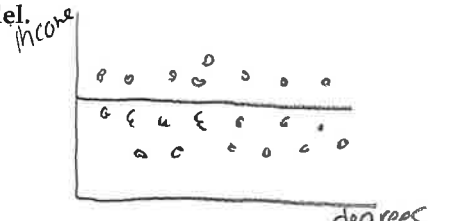
c) Interpret the coefficient on graduate_degree (18.50) in context:

annual income increase by 18.500 for thoes who have a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- □ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- □ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- □ Only 0.1% of the income difference between groups is due to random chance
- □ There's a 99.9% probability that the true coefficient is at least 18.5
- □ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Michael Canavan Student ID: 4530247

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

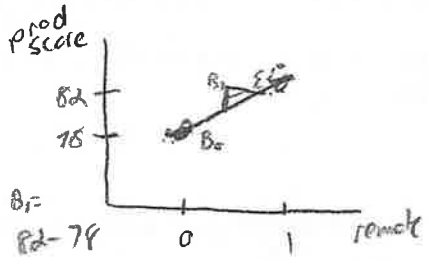
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

prod_score = B_0 + B_1 × remote + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $B_1 \neq 0$



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

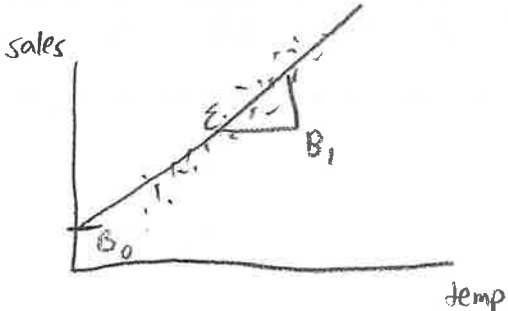
a) Write down a statistical model to test this question.

temp = B_0 + B_1 × sales + ε

b) What part of your statistical model would indicate that temperature affects sales?

$B_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

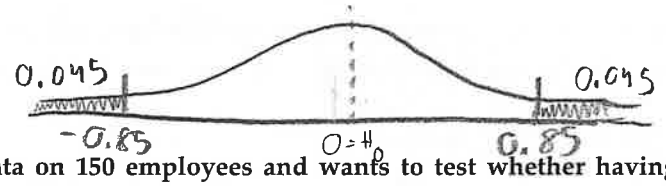
a) Write down a statistical model to test this relationship.

hrly_wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

hourly wages increase by 0.85 for every additional age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

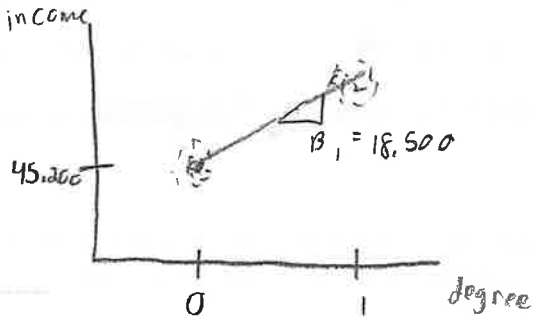


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

income for someone with no degree is 45.200

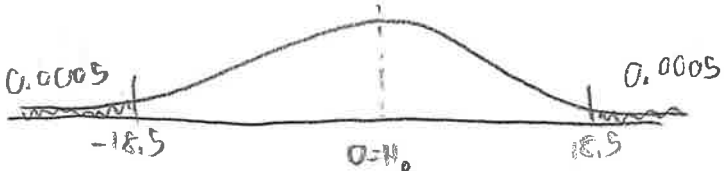
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

income increases by 18.50 if you have degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Anthony Chirinos Student ID: 4907004

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

AC I will complete this MiniExam solely using my own work.
AC I will not use any digital resources unless explicitly allowed by the instructor.
AC I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity_score = β_0 + β_1 × prod + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 0$

c) Based on the information given, what would β_1 equal? $\beta_1 = 1$

d) What is the default null hypothesis for β_1?

Remote workers are more productive on average

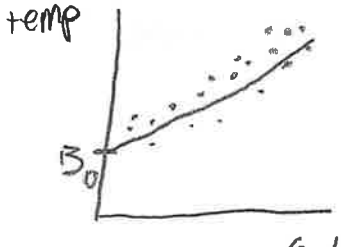
Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

hourly_wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.

b) Interpret the Intercept coefficient (45.20) in context:

Someone w/ a graduates degree makes 45.2

c) Interpret the coefficient on graduate_degree (18.50) in context:

Having it makes a diff by 18.5 in annual income depending on if someone has the degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☐ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☑ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Cooper Sainiali Student ID: 4154383 2

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

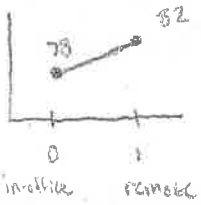
The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

CS I will complete this MiniExam solely using my own work.
CS I will not use any digital resources unless explicitly allowed by the instructor.
CS I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code remote as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity = β_0 + β_1 × remote + ϵ



b) Based on the information given, what would β_0 equal? β_0 = 78

c) Based on the information given, what would β_1 equal? β_1 = 4 ($\frac{82-78}{1-0}$)

d) What is the default null hypothesis for β_1? 0

↳ no relationship

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

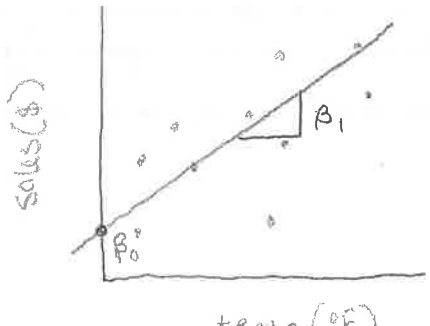
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp + ϵ

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

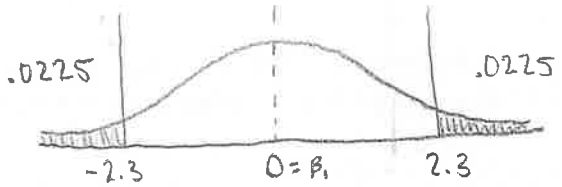
a) Write down a statistical model to test this relationship.

hourly_wages = β_0 + β_1 × age + ϵ

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

For a 1 unit increase in age (years), if there is a relationship between wages and age, we would see a $0.85 increase in hourly wages.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

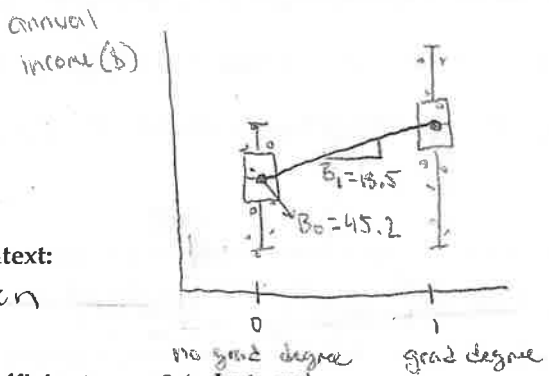


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

The annual income of someone without a graduate degree.

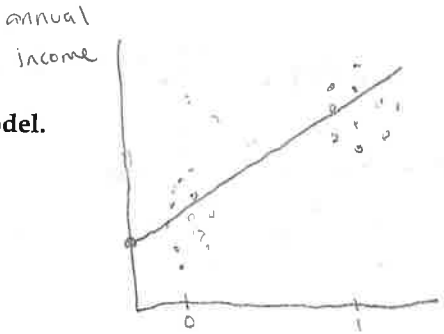
c) Interpret the coefficient on graduate_degree (18.50) in context:

The increase in annual income given a graduate degree being obtained.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- □ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ◉ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- □ Only 0.1% of the income difference between groups is due to random chance
- □ There's a 99.9% probability that the true coefficient is at least 18.5
- □ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Lukas Jones Student ID: LAS 116

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

- ✓ I will complete this MiniExam solely using my own work.
- ✓ I will not use any digital resources unless explicitly allowed by the instructor.
- ✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

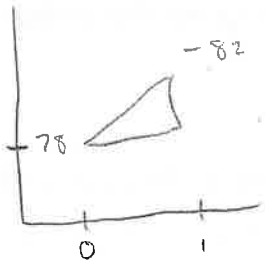
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity B_0 + B_1 × location + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $B_1 = 0$



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

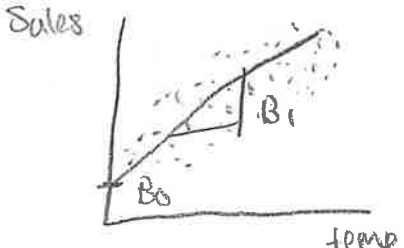
a) Write down a statistical model to test this question.

Sales = B_0 + B_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$B_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

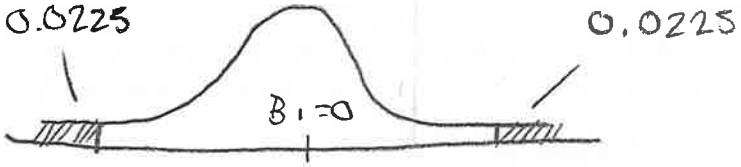
a) Write down a statistical model to test this relationship.

Wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

In this sample, for each year a person has aged, on average their salary will go up by 0.85 per hour.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

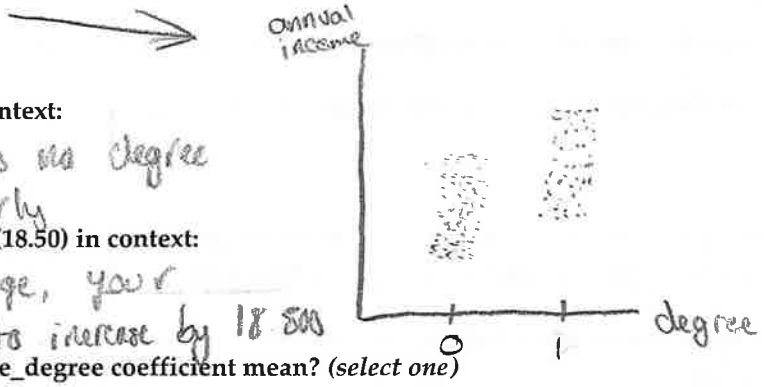


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

On average, the person who has no degree will make 45,200 yearly

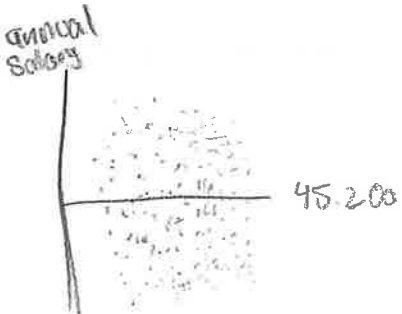
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

If you get a degree, on average, your annual salary is expected to increase by 18,500

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☒ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☐ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☒ There's a 99.9% probability that the true coefficient is at least 18.5
- ☒ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Zachary Tuley Student ID: 4642754

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

ZT I will complete this MiniExam solely using my own work.
ZT I will not use any digital resources unless explicitly allowed by the instructor.
ZT I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × Work Location + ϵ

b) Based on the information given, what would β_0 equal? $\beta_0 = 82$

c) Based on the information given, what would β_1 equal? $\beta_1 = -4$

d) What is the default null hypothesis for β_1? In office = Remote

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

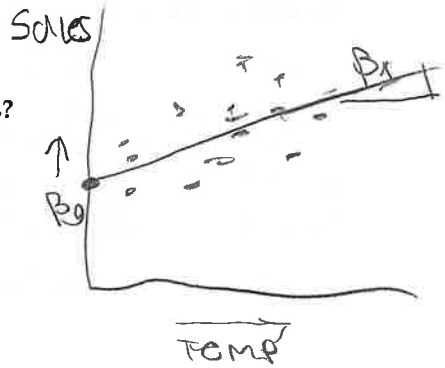
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × Temp + ϵ

b) What part of your statistical model would indicate that temperature affects sales?

β_1

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

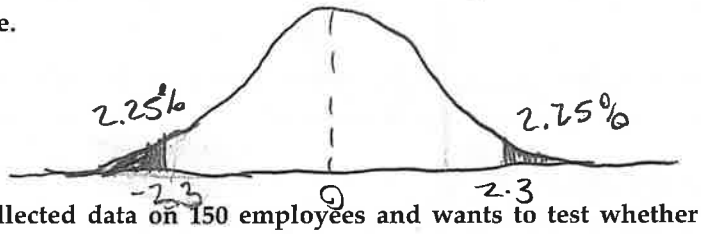
a) Write down a statistical model to test this relationship.

hourly wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

On average a worker gains 0.85$ for their hourly wage per year

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

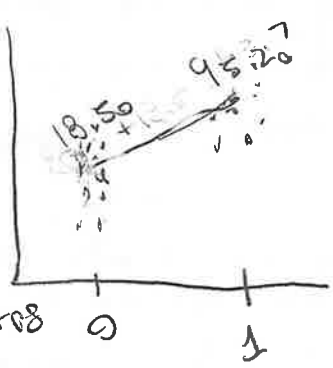


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

On average the same one with no graduate degree earns 45.2 thousand currency

c) Interpret the coefficient on graduate_degree (18.50) in context:

on average someone with no grad wages degree earns 18.5 K currency

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Henry Gallup Student ID: 4539909

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity = β_0 + β_1 × remote + ϵ

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 82 - 78 = 4$

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

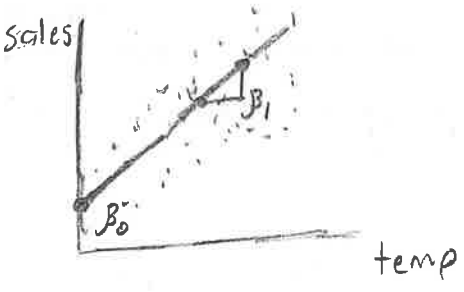
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp + ϵ

b) What part of your statistical model would indicate that temperature affects sales?

β_1 (slope)

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

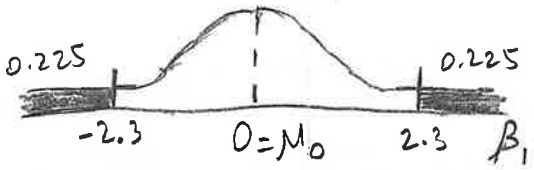
a) Write down a statistical model to test this relationship.

wages = β_0 + β_1 × age + ϵ

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

wages increase by 0.85 for every added year of age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.



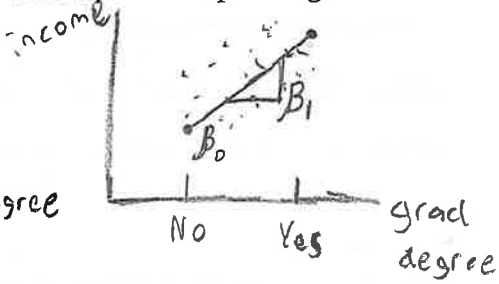
0.045/2 = 0.225

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Annual income for employees with no graduate degree is 45.20

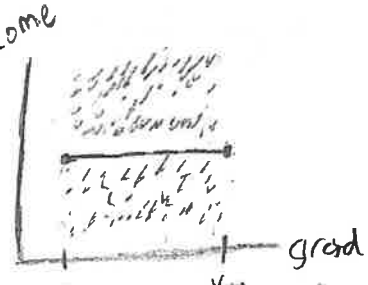
c) Interpret the coefficient on graduate_degree (18.50) in context:

Annual income increases by 18.50 if graduate degree is added

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

☑ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
☐ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
☐ Only 0.1% of the income difference between groups is due to random chance
☐ There's a 99.9% probability that the true coefficient is at least 18.5
☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Adam Arrington Student ID: 4844780

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity Score = β_0 + β_1 × In Out of Office + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 82

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 78 - 82 = -4

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

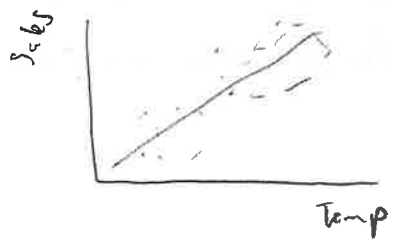
a) Write down a statistical model to test this question.

Ice Cream Sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

If β_1 is not equal to 0

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

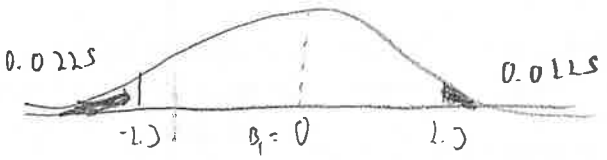
a) Write down a statistical model to test this relationship.

hourly_wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

For every 1 year increase in age, hourly wage increases by 0.85 on average

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

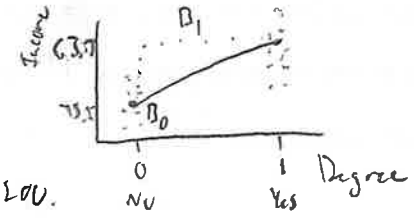


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

The mean annual income of individuals who do not have a graduate degree is $45,200.

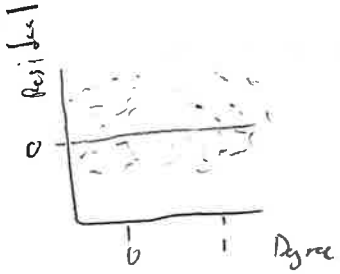
c) Interpret the coefficient on graduate_degree (18.50) in context:

Individuals who have a graduate degree earn on average $18,500 more than those who don't.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Madelyn Steele Student ID: 4669177

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

MS I will complete this MiniExam solely using my own work.
MS I will not use any digital resources unless explicitly allowed by the instructor.
MS I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity = β_0 + β_1 × work space + ε

b) Based on the information given, what would β_0 equal? β_0 = 82 (78)

remote = 0
office = 1

c) Based on the information given, what would β_1 equal? β_1 = -5

82 - 78

d) What is the default null hypothesis for β_1? $H: \beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

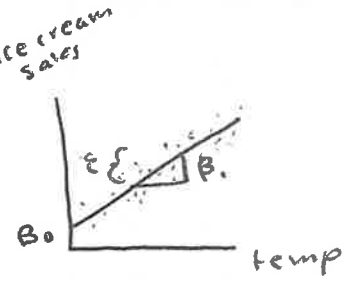
a) Write down a statistical model to test this question.

ice cream sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

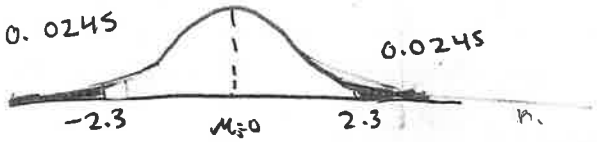
a) Write down a statistical model to test this relationship.

hourly wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

hourly wages increase by 0.85 for every additional year of age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

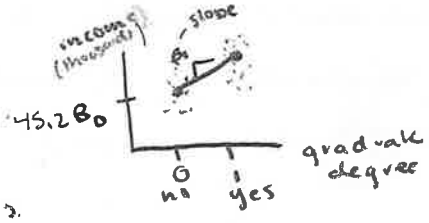


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

income (in thousands) for employees with no graduate degree is 45.2 thousand dollars.

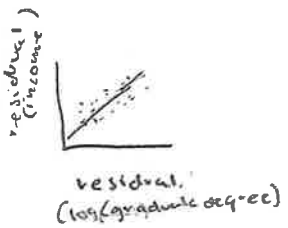
c) Interpret the coefficient on graduate_degree (18.50) in context:

income increases by 18.50 thousand dollars when an employee has received a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Matan Cohen Student ID: 4631169

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

MC I will complete this MiniExam solely using my own work.
MC I will not use any digital resources unless explicitly allowed by the instructor.
MC I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × (remote/in office) + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

$\beta_1 = 82 - 78 = 4$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

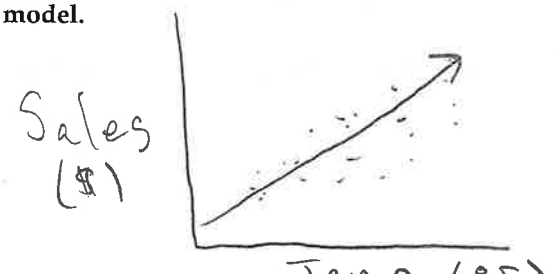
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × Temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

β_1

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

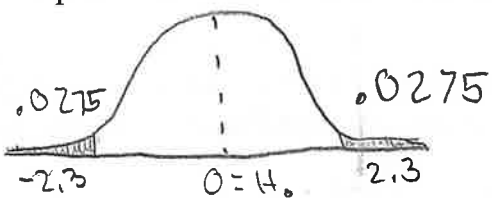
a) Write down a statistical model to test this relationship.

$\text{hourly\_wages} = \beta_0 + \beta_1 \times \text{age} + \varepsilon$

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

For every one year increase in age, hourly wages are expected to increase by 85 cents.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

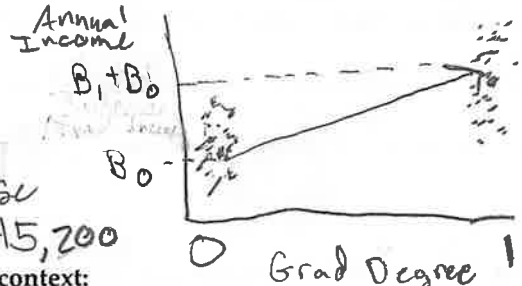


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

The mean annual income for those without a graduate degree is $45,200

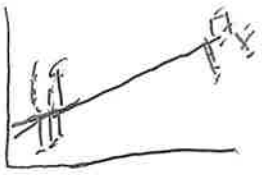
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

The mean annual income for those with a graduate degree is $18,500 than the mean annual income of those without.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Mikailyn Matacavage Student ID: 4656864

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

MM I will complete this MiniExam solely using my own work.
MM I will not use any digital resources unless explicitly allowed by the instructor.
MM I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity = β_0 + β_1 × remote + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

82 - 78 = 4

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

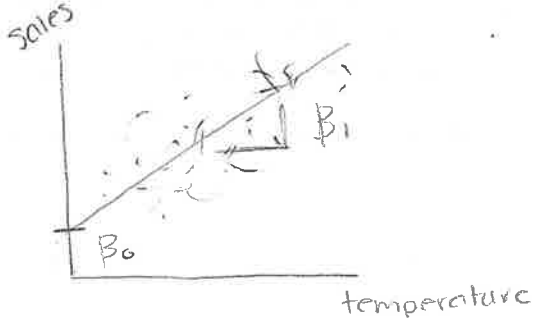
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temp. + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

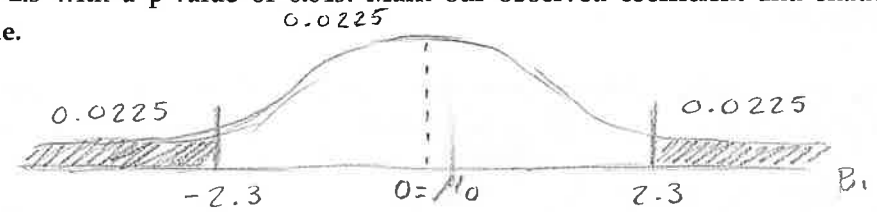
a) Write down a statistical model to test this relationship.

wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

wages increase by 0.85 for every additional year in ages.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

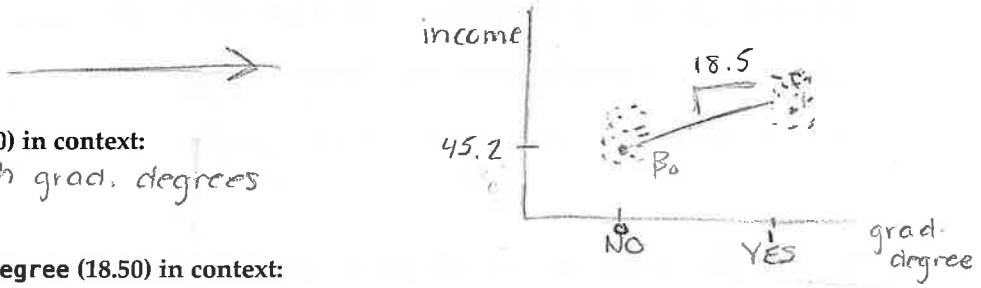


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

		coef	std err	t	P>|t|	[0.025	0.975]
Intercept	β_0	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree		18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Incomes for employers with grad. degrees is 45.2

c) Interpret the coefficient on graduate_degree (18.50) in context:

Incomes increase by 18.5 with a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Kiersten Engstrom Student ID: 4719223

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

KE I will complete this MiniExam solely using my own work.
KE I will not use any digital resources unless explicitly allowed by the instructor.
KE I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = B_0 + B_1 × remote + ε

82 - 78 = 4

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

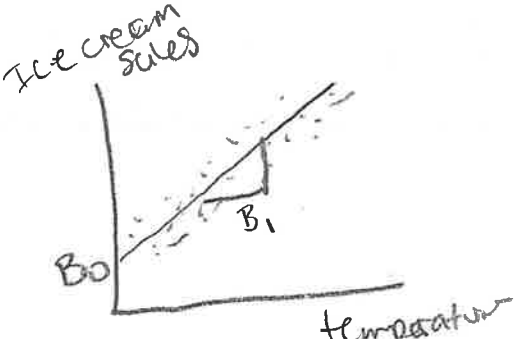
a) Write down a statistical model to test this question.

Ice cream sales = B_0 + B_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

$B_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

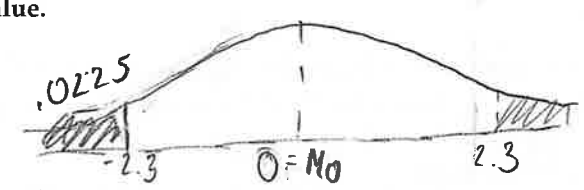
a) Write down a statistical model to test this relationship.

hourly_wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Hourly wages increase by .85 for every additional year of age.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.



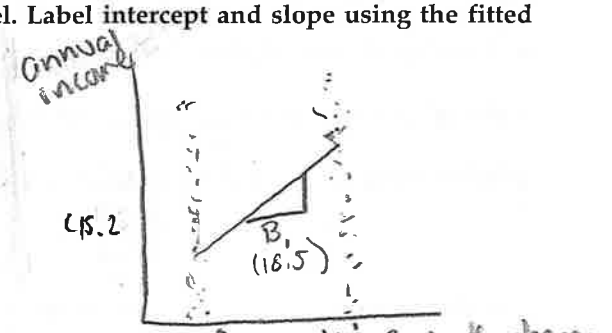
$.0225 = \frac{.045}{2}$

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Those without a graduate degree have an annual income of 45.20.

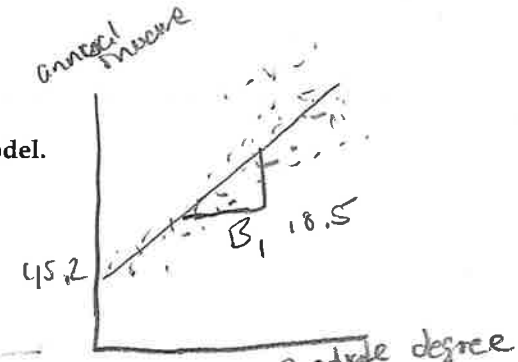
c) Interpret the coefficient on graduate_degree (18.50) in context:

Those with a graduate degree have an annual income 18.5 more than those who don't have one.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Mckenna hooks Student ID: 4785940

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

mph I will complete this MiniExam solely using my own work.
mph I will not use any digital resources unless explicitly allowed by the instructor.
mph I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity = B_0 + B_1 × remote + ε

b) Based on the information given, what would β_0 equal? β_0 = no

c) Based on the information given, what would β_1 equal? β_1 = yes

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

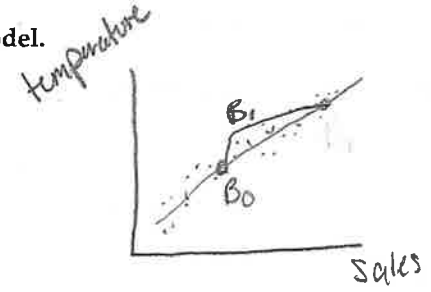
a) Write down a statistical model to test this question.

sales = B_0 + B_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

B_1

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts `hourly_wages` using a sample of n=250 workers.

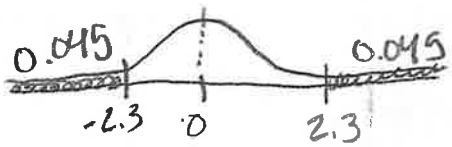
a) Write down a statistical model to test this relationship.

hourly_wages = B_0 + B_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

hourly wages increase by 0.85 when age increases.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.



Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.

b) Interpret the Intercept coefficient (45.20) in context:

income is 45.20 with no graduate degree

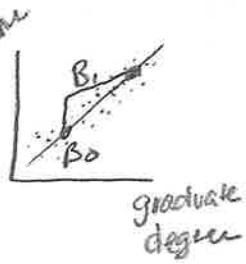
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

income increase by 18.50 with a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

□ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
□ Only 0.1% of the income difference between groups is due to random chance
□ There's a 99.9% probability that the true coefficient is at least 18.5
□ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: matt Files Student ID: 4671920

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

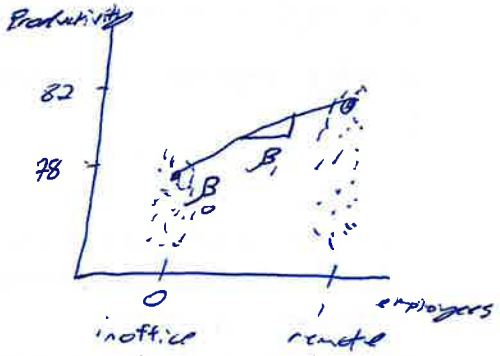
The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity score = β_0 + β_1 × employee location + ε



b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

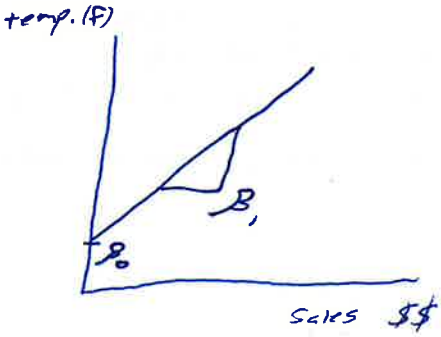
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

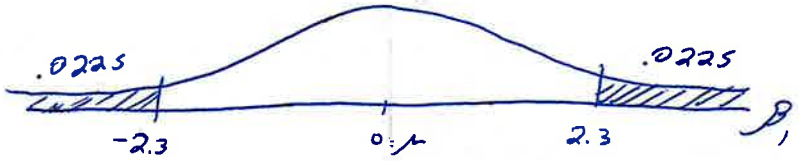
a) Write down a statistical model to test this relationship.

hourly wage = β_0 + β_1 × age + ϵ

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Every year older you get, your hourly wage increases by: .85

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

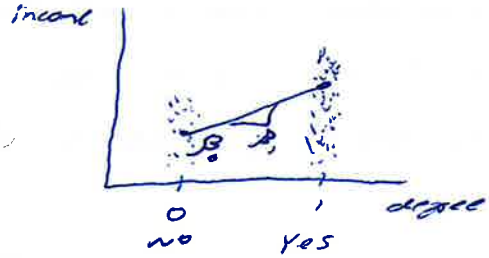


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

The average annual salary of no college degree is: 45.20

c) Interpret the coefficient on `graduate_degree` (18.50) in context:

You are more likely to make 18.5$ more with a college degree than without

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ■ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Kenji Zhang Student ID: 6692242

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

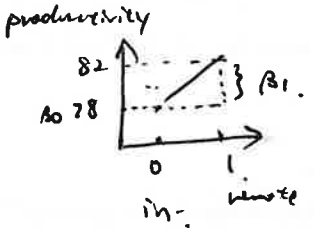
The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

KZ I will complete this MiniExam solely using my own work.
KZ I will not use any digital resources unless explicitly allowed by the instructor.
KZ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity β_0 + β_1 × workers + ε



b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $\beta_1 \neq 0$.

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

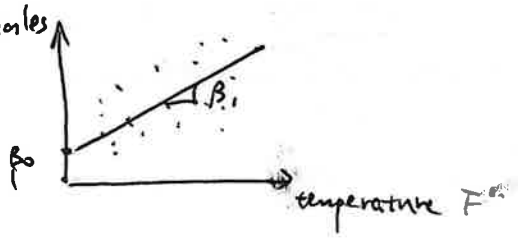
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temperature + ε.

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$, relation exists.

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts `hourly_wages` using a sample of n=250 workers.

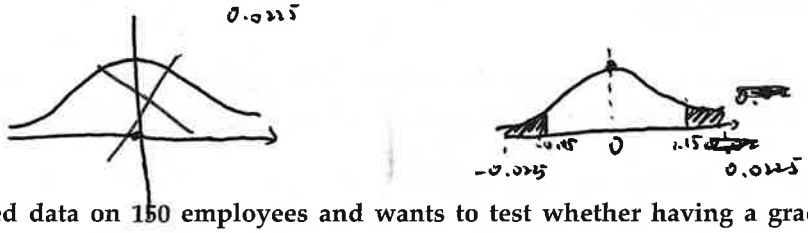
a) Write down a statistical model to test this relationship.

hourly wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

with every 1 unit (1%) of age increase, 0.85 increase in hourly wages.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

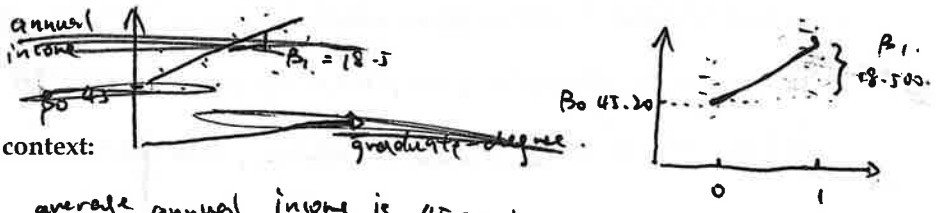


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

when x=0 (no graduate degree), average annual income is 45.20 k.

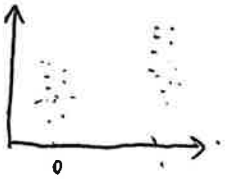
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

when there's 1 unit increase (have graduate degree), average annual income increases 18.5 k.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☐ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Scarlett Weir Student ID: 4759355

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

SW I will complete this MiniExam solely using my own work.
SW I will not use any digital resources unless explicitly allowed by the instructor.
SW I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

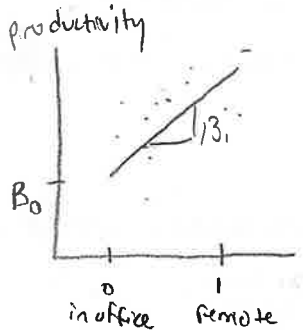
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × remote/in_office + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $\beta_1 \neq 0$



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

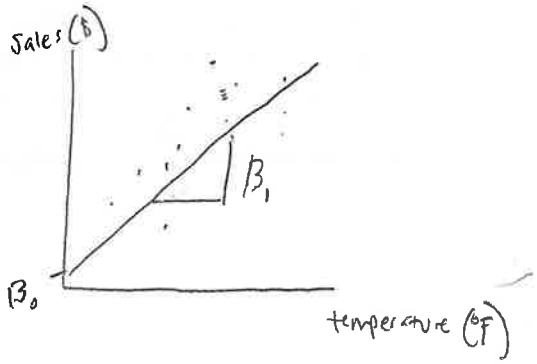
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model. →



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

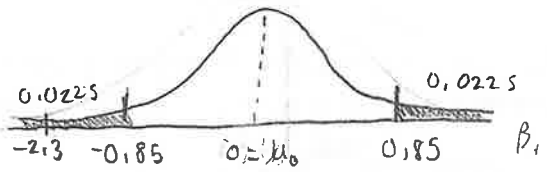
a) Write down a statistical model to test this relationship.

hourly_wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Hourly wages increase by 0.85 for every additional year of age.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

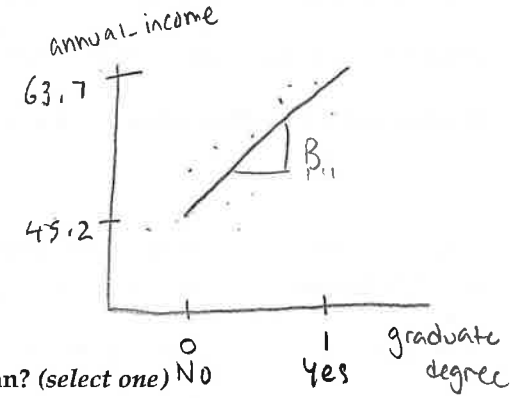


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

The annual income for workers without a graduate degree is 45.20.

c) Interpret the coefficient on graduate_degree (18.50) in context:

The annual income for workers increases by 18.50 if they have a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Jean-Luc Tersier Student ID: 4652635

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

JLT I will complete this MiniExam solely using my own work.
JLT I will not use any digital resources unless explicitly allowed by the instructor.
JLT I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity score = β_0 + β_1 × remote + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $H_0: \beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

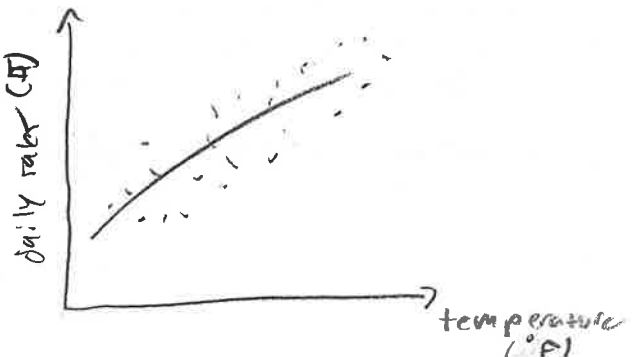
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

IF β_1 is non-zero, that would indicate that temperature has an effect on sales.

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

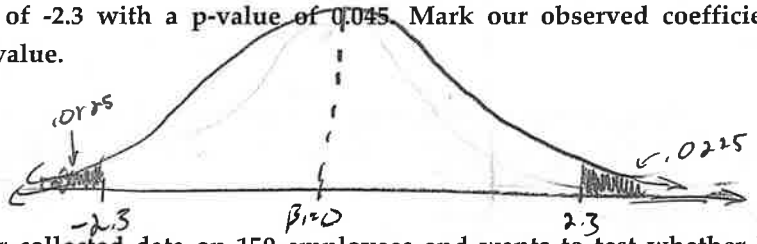
a) Write down a statistical model to test this relationship.

hourly_wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

for every unit increase in age, most likely 1 year, we would expect a worker's hourly wage to increase by $0.85

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.



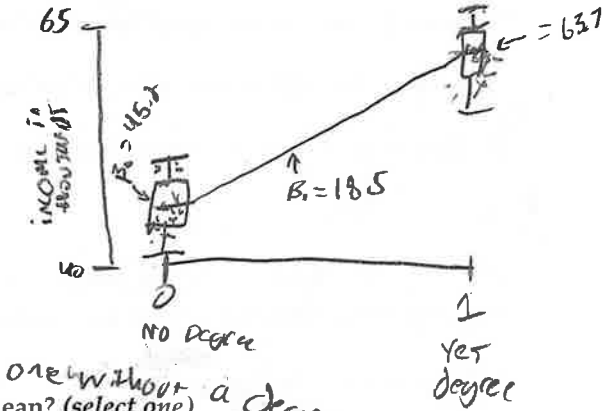
Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

45.2
18.5
63.7

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

On average, employees with no graduate degree earn 45,200 dollars a year.

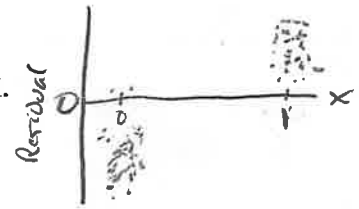
c) Interpret the coefficient on graduate_degree (18.50) in context:

On average, an employee with a graduate degree will earn 18,500 more dollars per year than one without a degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is atleast 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Chase Nava Student ID: 4654536

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

CN I will complete this MiniExam solely using my own work.
CN I will not use any digital resources unless explicitly allowed by the instructor.
CN I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

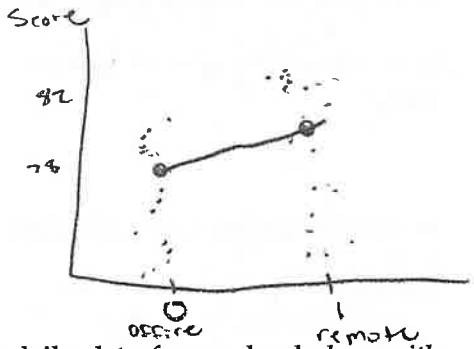
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Score = β_0 + β_1 × Worker + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 82 - 78 = 4$

d) What is the default null hypothesis for β_1? $H = 0$



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

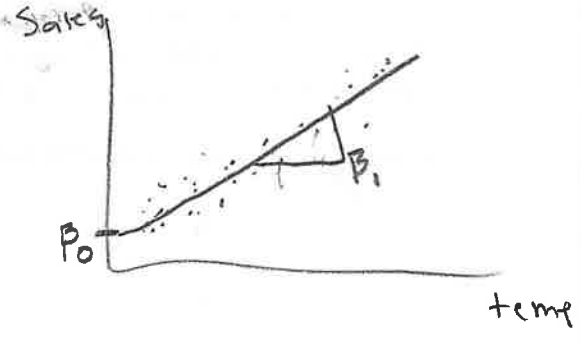
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

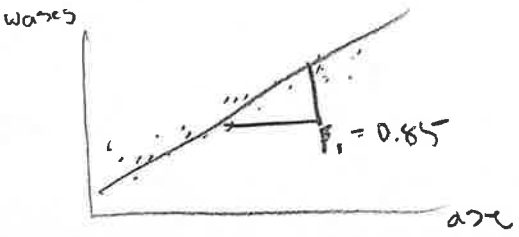
c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

Wage = β_0 + β_1 × age + ε



b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

wages increase by .85 for every additional year of age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

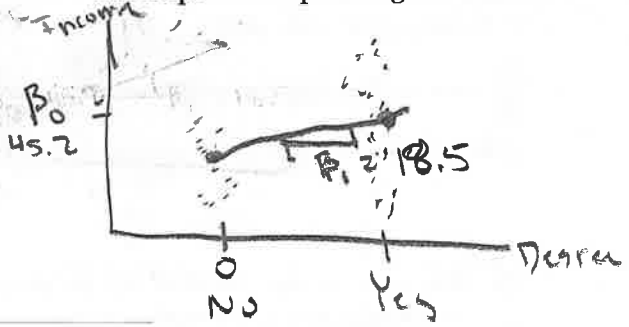
0.045
-0.0225
0.0225

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Wages with no graduate degree are 45.2

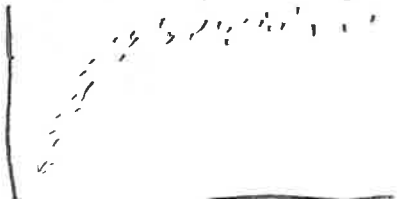
c) Interpret the coefficient on graduate_degree (18.50) in context:

wages increase by 18.5 with a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ● If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Ethan Papa Student ID: 4537873

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

EP I will complete this MiniExam solely using my own work.
EP I will not use any digital resources unless explicitly allowed by the instructor.
EP I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

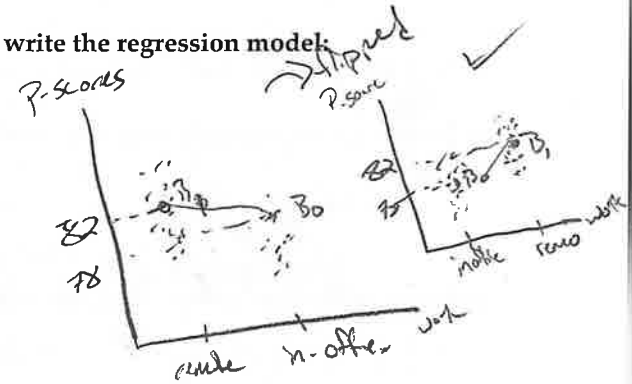
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity-S = β_0 + β_1 × Work + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 82

d) What is the default null hypothesis for β_1? 1



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

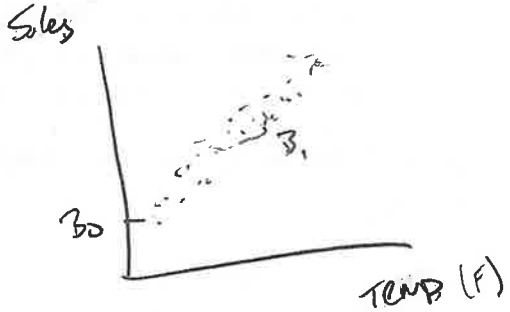
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × Temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$ (probably positive)

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

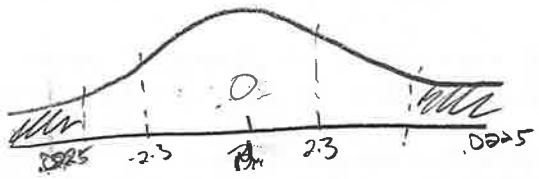
a) Write down a statistical model to test this relationship.

wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

85% of the wage plays a positive relationship

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

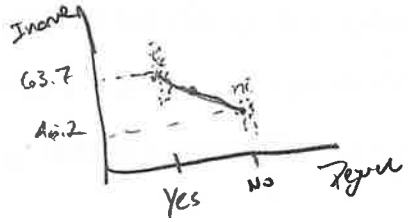


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

$45k for no degree average

c) Interpret the coefficient on `graduate_degree` (18.50) in context:

$18.5k more for degree average

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? ***(select one)*** Fail to reject null hypothesis unless smaller than .001

- □ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- □ Only 0.1% of the income difference between groups is due to random chance
- □ There's a 99.9% probability that the true coefficient is at least 18.5
- □ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Hannah Ghobrial Student ID: 4611952

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

HG I will complete this MiniExam solely using my own work.
HG I will not use any digital resources unless explicitly allowed by the instructor.
HG I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

82 - 78 = 4

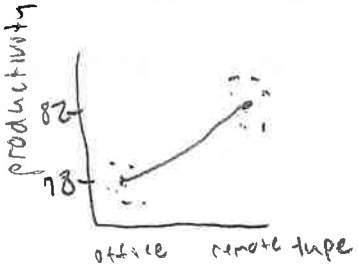
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity score = β_0 + β_1 × type of worker + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $\beta_1 = 0$



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

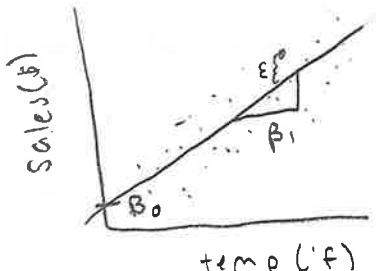
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

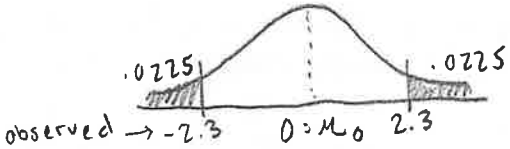
a) Write down a statistical model to test this relationship.

hourly-wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

On average, hourly wages increase by 0.85 units for every additional increase in age.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

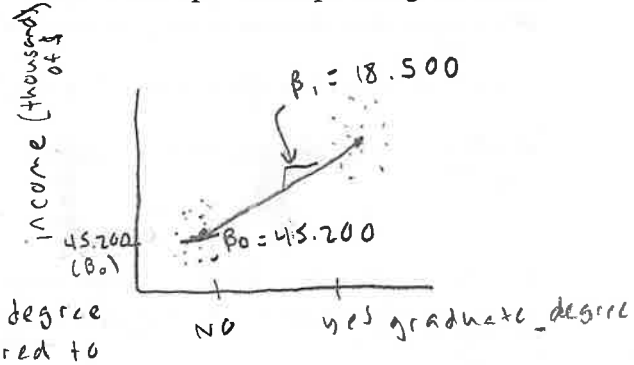


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

On average, the annual income for workers with no grad degree is $45,200

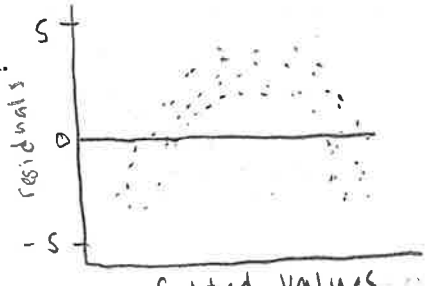
c) Interpret the coefficient on graduate_degree (18.50) in context:

On average, workers with a graduate degree make an additional income of $18,500 compared to those with no graduate degree.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples ~~where graduate degrees truly matter~~, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ ~~Only 0.1% of the income difference between groups is due to random chance~~
- ☐ ~~There's a 99.9% probability that the true coefficient is at least 18.5~~
- ☐ ~~The coefficient of 18.5 has a 0.1% margin of error~~

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Sophia Ghobrial Student ID: 4611953

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity score = β_0 + β_1 × work location + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4 $\quad \beta_1 = 82 - 78 = 4$

d) What is the default null hypothesis for β_1? no relationship between work location and avg productivity score ($\beta_1 = 0$) → no slope

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

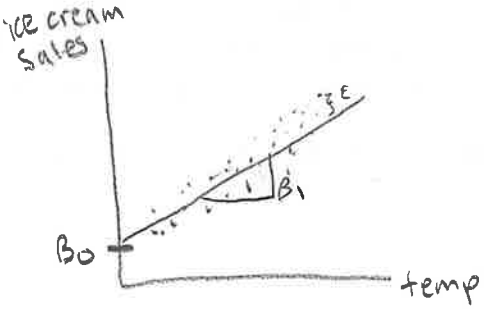
a) Write down a statistical model to test this question.

ice cream sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

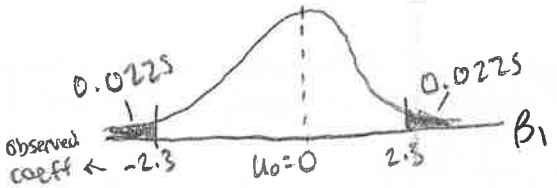
a) Write down a statistical model to test this relationship.

hourly wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Hourly wages increase by 0.85 on average for every additional year of age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

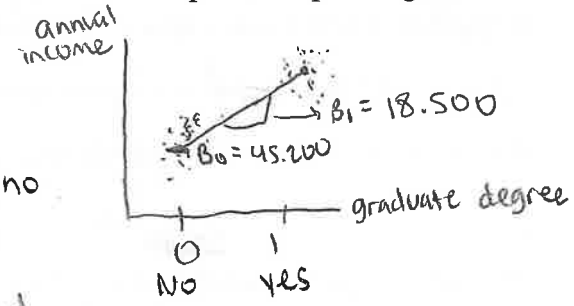


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept →	45.200 β_0	2.100	21.524	0.000	41.044	49.356
graduate_degree →	18.500 β_1	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Average annual income for workers with no graduate degree is 45.20 thousand dollars

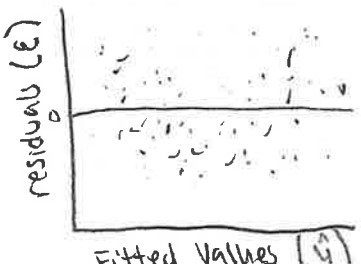
c) Interpret the coefficient on graduate_degree (18.50) in context:

Annual income increases by 18.50 thousand dollars on average for the group with graduate degrees

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ ~~Out of 1000 samples where~~ graduate degrees truly matter, only 1 would show a coefficient this large
- ■ If graduate degrees are unrelated (null) to income, 0.1% of samples would have a coefficient this far from zero
- ☐ ~~Only 0.1% of~~ the income difference between groups is due to random chance
- ☐ ~~There's a 99.9%~~ probability that the true coefficient is at least 18.5
- ☐ ~~The coefficient of~~ 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Anna Merlos Student ID: 9665152

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

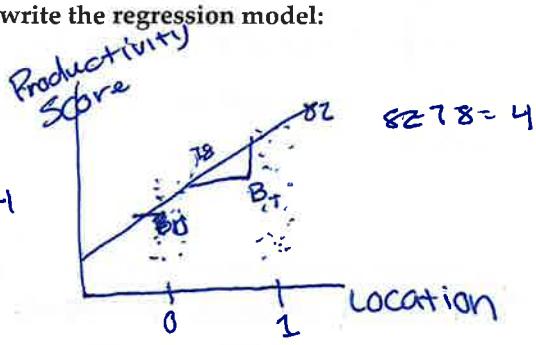
AM I will complete this MiniExam solely using my own work.
AM I will not use any digital resources unless explicitly allowed by the instructor.
AM I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

location?

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity score = B_0 + B_1 × _____ + ε



b) Based on the information given, what would β_0 equal? β_0 = 78

c) Based on the information given, what would β_1 equal? β_1 = 0.4 or 4

d) What is the default null hypothesis for β_1? _____

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

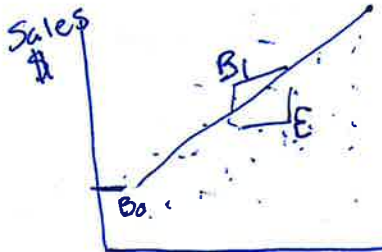
a) Write down a statistical model to test this question.

Sales (dollar) = B_0 + B_1 × temp. + ε

b) What part of your statistical model would indicate that temperature affects sales?

B_1 x temp

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

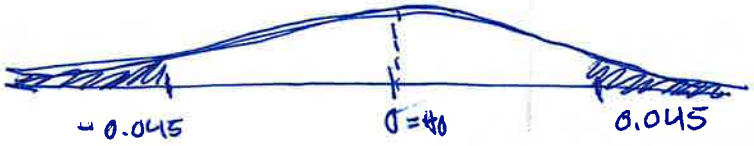
hourly wages = B_0 + B_1 × Age + ε

(slope)

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

If 0.85 = B_1 hourly wages increase by 0.85 for every additional year of experience

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

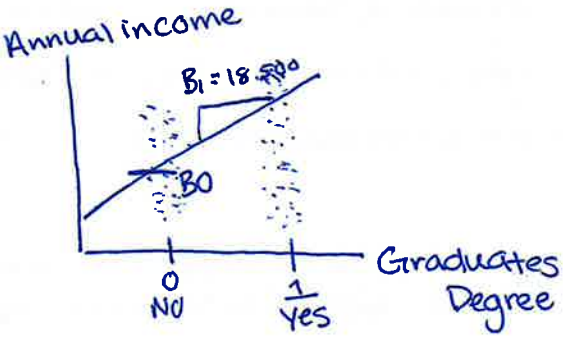


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200 (B0)	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500 (B1)	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

a/o Annual income without a grad degree is 45.200

c) Interpret the coefficient on graduate_degree (18.50) in context:

Annual income increases by 18.500 with those who do have a graduates degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☒ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☒ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Alexis Alarcon Student ID: 4620752

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

AA I will complete this MiniExam solely using my own work.
AA I will not use any digital resources unless explicitly allowed by the instructor.
AA I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity = β_0 + β_1 × remote + ε_i $\quad \beta_0 + \beta_1 X + \varepsilon_i = y$

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 82$

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp + ε_i

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.

Q3. You want to examine whether age predicts `hourly_wages` using a sample of n=250 workers.

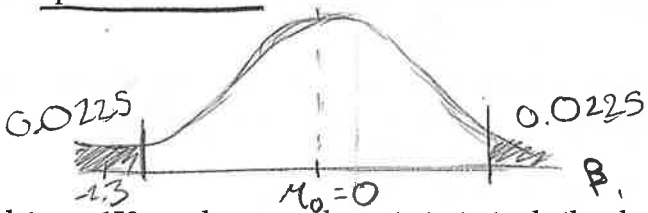
a) Write down a statistical model to test this relationship.

hourly_wage = β_0 + β_1 × age + ε_i

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

for every 1 unit increase in age, the hourly wage increases by 0.85

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

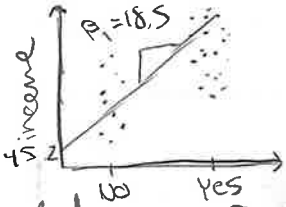


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows: income = 45.20 + 18.5 degree

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

if every our variable in the model was 0, income would be $45,200.

c) Interpret the coefficient on `graduate_degree` (18.50) in context:

having a graduate degree is associated with a $18,500 increase in wage.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☑ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☒ There's a 99.9% probability that the true coefficient is at least 18.5
- ☒ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Ruby Iskandarani Student ID: 4806285

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

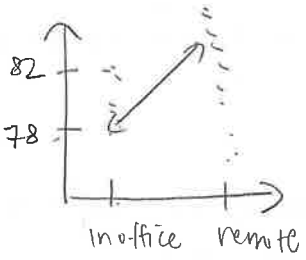
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × workers + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 82 - 78 = 4$

d) What is the default null hypothesis for β_1? 0



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

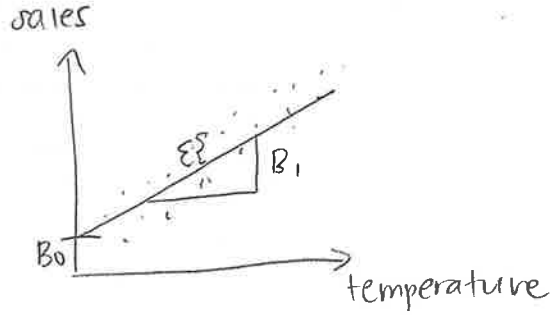
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

β_1

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

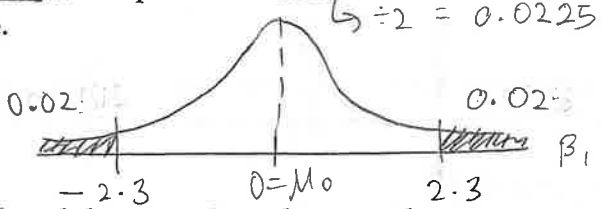
a) Write down a statistical model to test this relationship.

wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

wages increase by 0.85 for every one-year increase in age.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

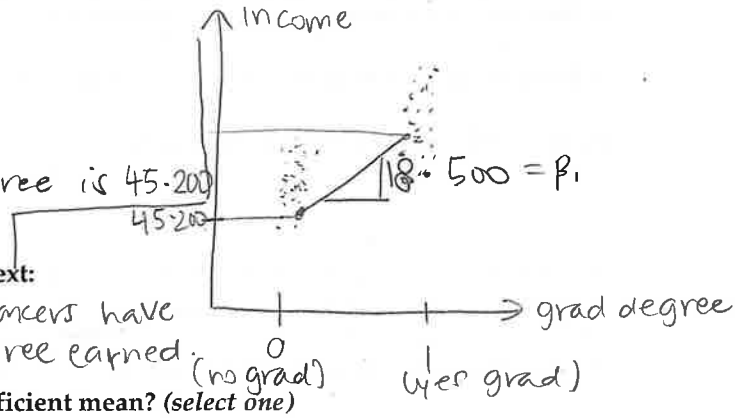


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Income for workers with no graduate degree is 45.200

c) Interpret the coefficient on graduate_degree (18.50) in context:

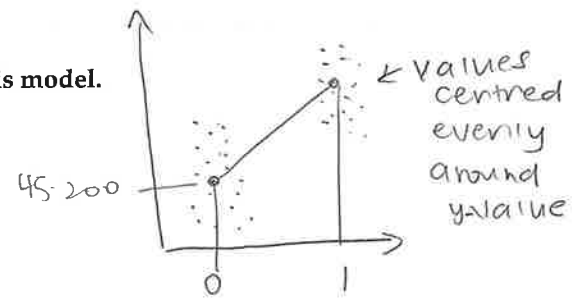
Income increase by 18.500 when workers have a graduate degree / for every graduate degree earned.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

□ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
□ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
□ Only 0.1% of the income difference between groups is due to random chance -
□ There's a 99.9% probability that the true coefficient is at least 18.5
□ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

idk i tried.



Name: Katie Hovan Student ID: 4655199

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × work location + ε

b) Based on the information given, what would β_0 equal? β_0 = 80

c) Based on the information given, what would β_1 equal? β_1 = 82 - 78 = 4

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

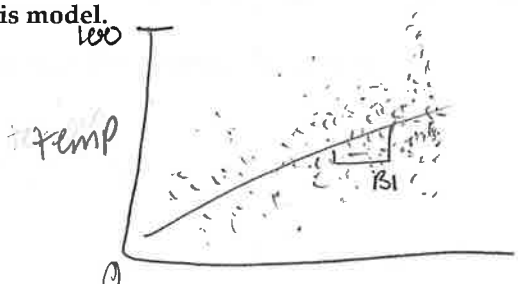
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

If the temperature goes up, there is a greater chance more sales would be made

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts `hourly_wages` using a sample of n=250 workers.

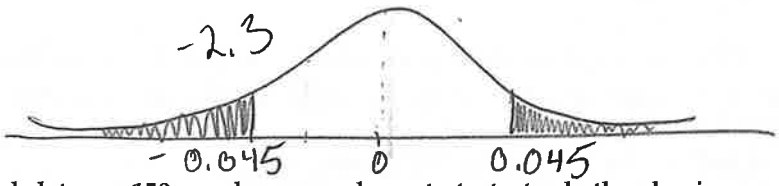
a) Write down a statistical model to test this relationship.

hour wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

wages increase with age by 0.85 for every additional year of work experience

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

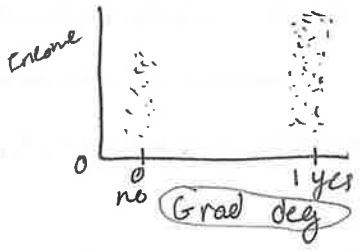


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Income for those with graduate degrees is 45.20

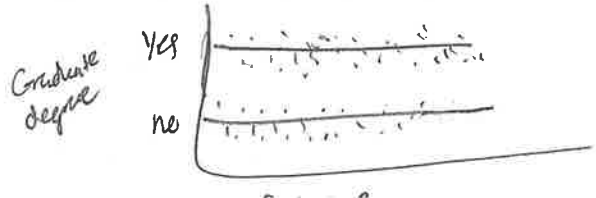
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

Income increases by 18.50 for every graduate that gets a graduates degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Jay Zheng Student ID: 4766538

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

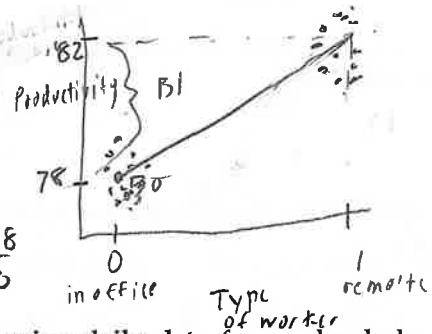
productivity score = β_0 + β_1 × Type of worker + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

$\beta_1 = \frac{82-78}{1-0}$

d) What is the default null hypothesis for β_1? $H_0: \beta_1 = 0$



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

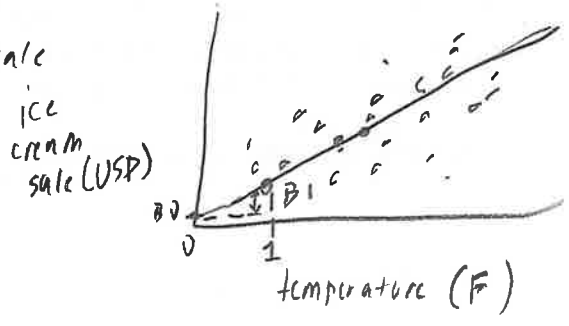
a) Write down a statistical model to test this question.

ice cream sale = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

When $\beta_1 \neq 0$, to show that there is a correlation between temp vs sale

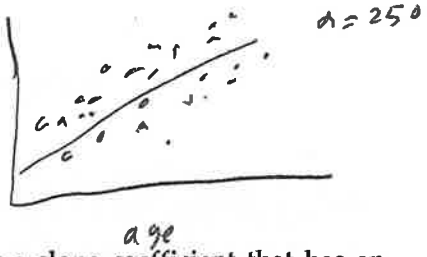
c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

hourly wage = B_0 + B_1 × age + E

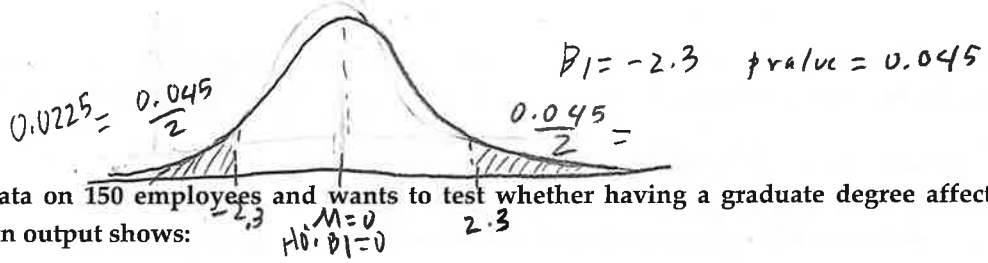


b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

The hourly wage increase by $0.85, per every 1unit (yr) of age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

2 | 0.0450 → 0.0225



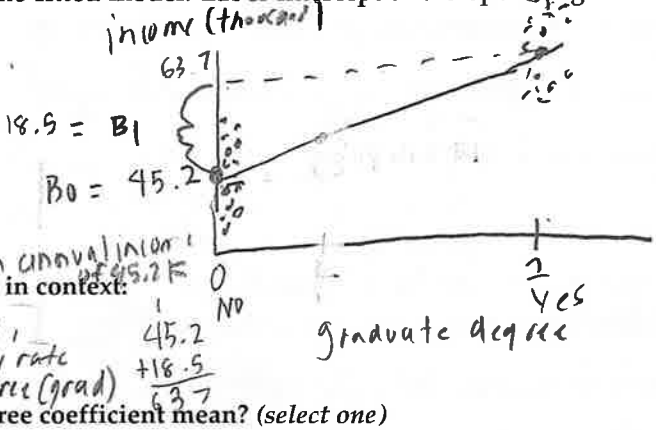
$B_1 = -2.3$ p value = 0.045

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

On average, when employee don't have a graduate degree, the earn annual income of $45.2 K

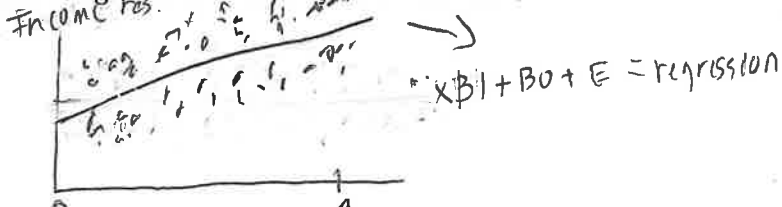
c) Interpret the coefficient on graduate_degree (18.50) in context:

When employee have an graduate degree, their annual income on average increase by rate of 18.5K per Obtaining 1unit to an degree (grad)

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Willong Chen Student ID: 4571386

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × office + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $H_0: \beta_1 = 0$

82 − 78 = 4

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

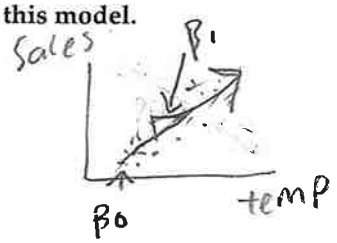
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

$wages = \beta_0 + \beta_1 \times age + \varepsilon$

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Wages increase by 0.85 for every additional age.

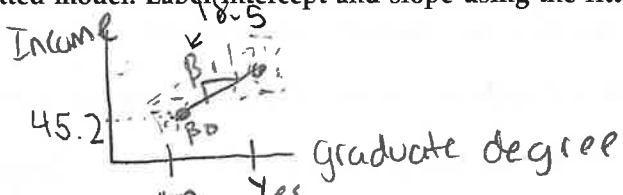
Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Income for employees with no graduate degree.

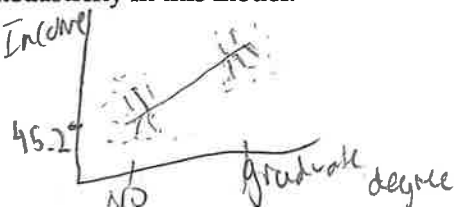
c) Interpret the coefficient on graduate_degree (18.50) in context:

Income increases by 18.5 for an employee with graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☒ There's a 99.9% probability that the true coefficient is at least 18.5
- ☒ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Emily Rod Student ID: ear113 9623

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity score = β_0 + β_1 × remote worker + ε

if yes: remote worker = 1

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

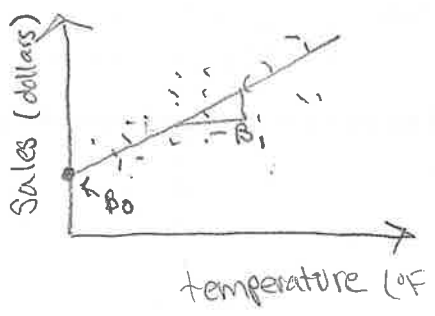
a) Write down a statistical model to test this question.

Sales (dollars) = β_0 + β_1 × temperature (°F) + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

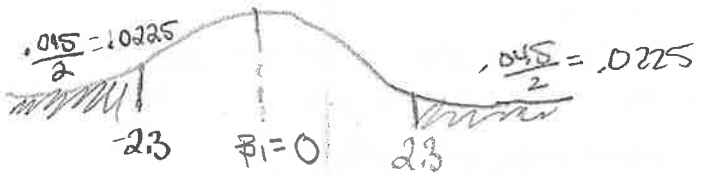
a) Write down a statistical model to test this relationship.

hourly wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

For each additional year in age, hourly wage increases by .85.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

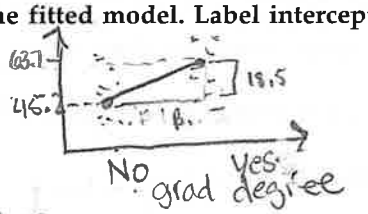


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

IF there is not a grad degree, income is predicted to be $45,200.

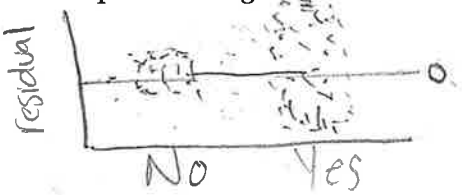
c) Interpret the coefficient on graduate_degree (18.50) in context:

If there is a graduate degree, income increases $18,500 (to $63,700).

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

□ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
□ Only 0.1% of the income difference between groups is due to random chance
□ There's a 99.9% probability that the true coefficient is at least 18.5
□ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Yuqin Li Student ID: 4578696

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

U I will complete this MiniExam solely using my own work.
U I will not use any digital resources unless explicitly allowed by the instructor.
U I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

exam ie = β_0 + remote × β_1 + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

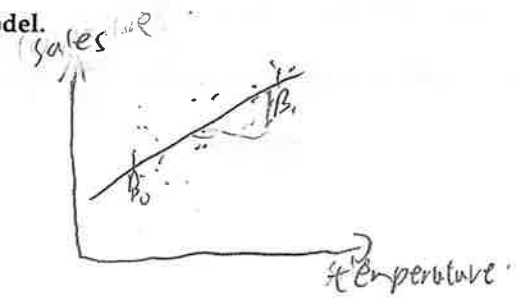
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



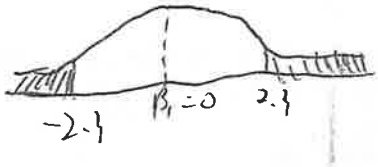
Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

hourly_wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

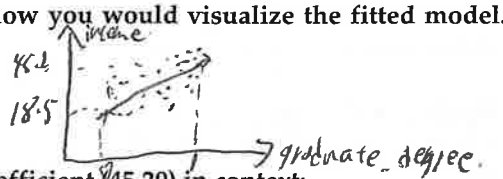


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

graduate_degree is coded as Yes, income is in thousands of dollars

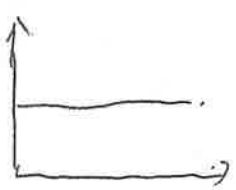
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

graduate_degree is coded as NO; income is in thousands of dollars

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Joseph Corella Student ID: 4515976

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

JC I will complete this MiniExam solely using my own work.
JC I will not use any digital resources unless explicitly allowed by the instructor.
JC I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

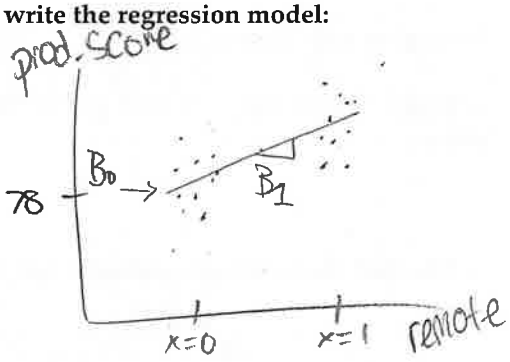
a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

prod.score = B_0 + B_1 × remote + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? 0



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

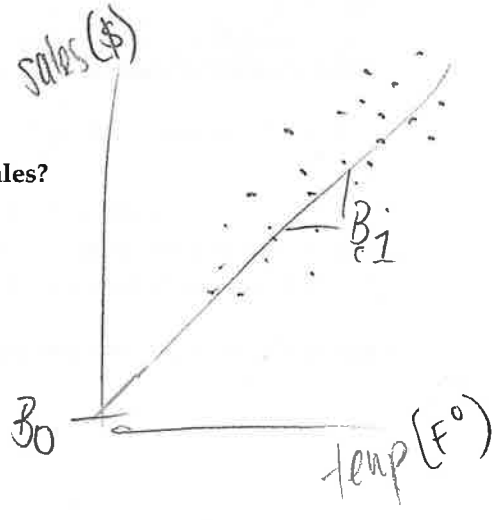
a) Write down a statistical model to test this question.

Sales = B_0 + B_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

B_1

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

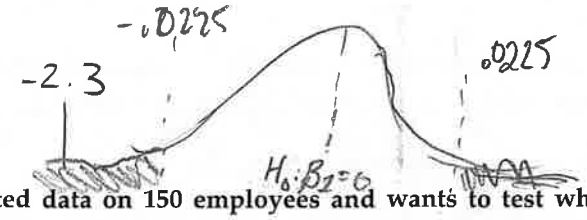
a) Write down a statistical model to test this relationship.

h_wage = B_0 + B_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Wage increases $.85 for each additional age unit

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

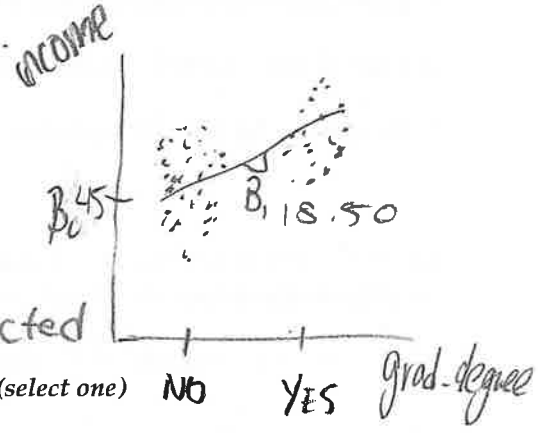


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

If X=0, and only, 45.20 would be the predicted income.

c) Interpret the coefficient on graduate_degree (18.50) in context:

A 18.50 increase in income is expected when degree is obtained.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☐ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☑ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Daniel Herrera Student ID: 4613422

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

DH I will complete this MiniExam solely using my own work.
DH I will not use any digital resources unless explicitly allowed by the instructor.
DH I will not communicate directly or indirectly with others during the MiniExam.

n=80

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

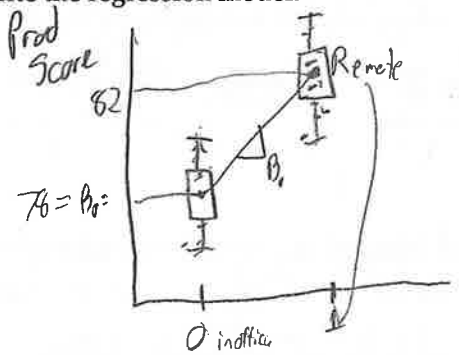
Production Score = β_0 + β_1 × Remote + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

$\beta_1 = 82 - 78$



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

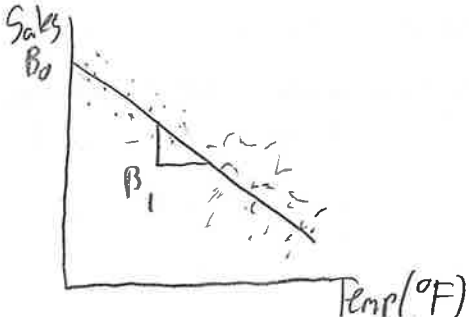
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × Temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

If $\beta_1 \neq 0$, then temp affects sales

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

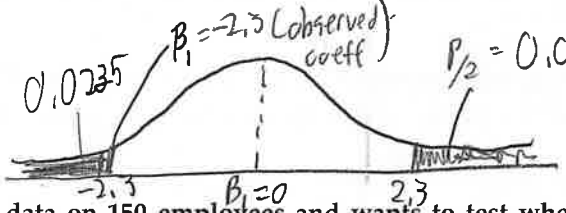
a) Write down a statistical model to test this relationship.

hr_wages = β_0 + β_1 × age + ϵ

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Wages increase by $0.85 for every additional year in age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.



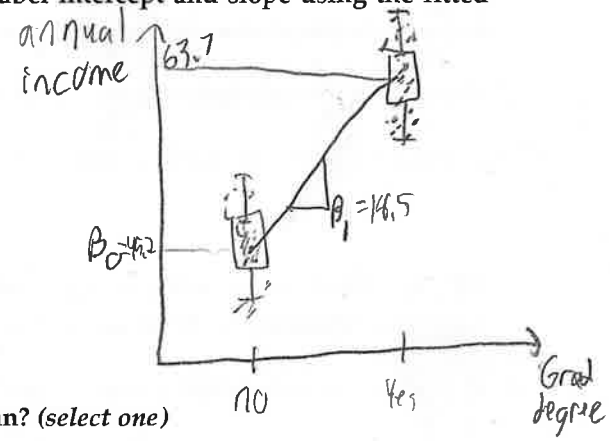
$\beta_1 = -2.3$
$p = 0.045$

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows: n=150

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	β_0 = 45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	β_1 = 18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Annual income for employees without graduate degree is 45.2 thousand dollars

c) Interpret the coefficient on graduate_degree (18.50) in context:

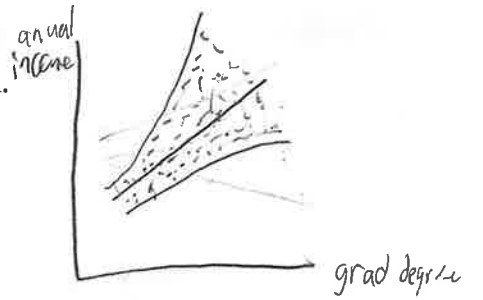
Annual income increases by 18.5 thousand dollars if you have a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ ~~Out of 1000 samples where graduate degrees truly matter, only 1 would show~~ a coefficient this large
- ☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income ~~difference between groups~~ is due to random chance
- ☐ There's a 99.9% probability that ~~the true coefficient~~ is at least 18.5
- ☐ The coefficient of 18.5 has a ~~0.1% margin~~ of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

idk it thats a great drawing but what I trying to show is increasing variability in income as X axis increases. also making it so it has positive slope.



Name: Kyle Reardon Student ID: 4626331

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

KR I will complete this MiniExam solely using my own work.
KR I will not use any digital resources unless explicitly allowed by the instructor.
KR I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

$y = \beta_0 + \beta_1 \times \text{remote workers} + \varepsilon$

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

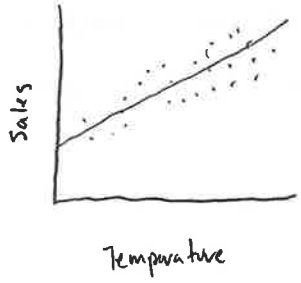
a) Write down a statistical model to test this question.

$y = \beta_0 + \beta_1 \times \text{temperature} + \varepsilon$

b) What part of your statistical model would indicate that temperature affects sales?

If β_1 is not 0, then temperatures would affect sales.

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

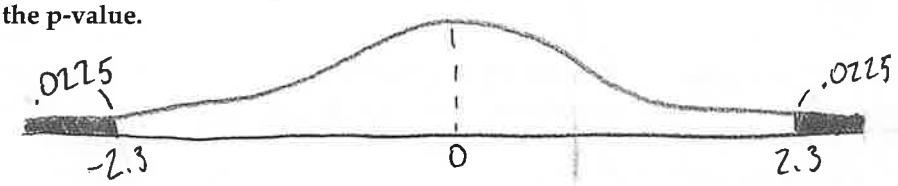
a) Write down a statistical model to test this relationship.

$y = \beta_0 + \beta_1 \times age + \varepsilon$

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

For every .85 year increase in age, wages will increase by $1.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

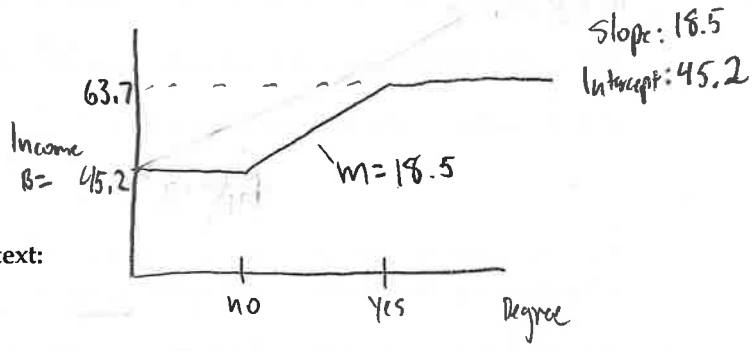


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Not having a degree gives a base income of 45.2.

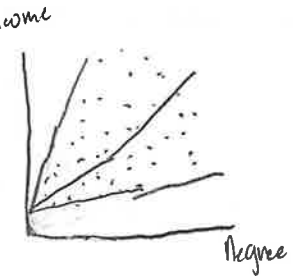
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

Income increases by 18.5 when you have a degree.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Dylan Jones Student ID: 4647898

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

____ I will complete this MiniExam solely using my own work.
____ I will not use any digital resources unless explicitly allowed by the instructor.
____ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity = β_0 + β_1 × worker location + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4

d) What is the default null hypothesis for β_1? $\neq 4$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

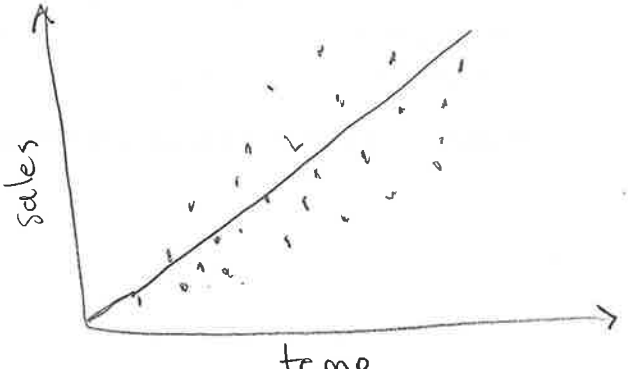
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp. + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

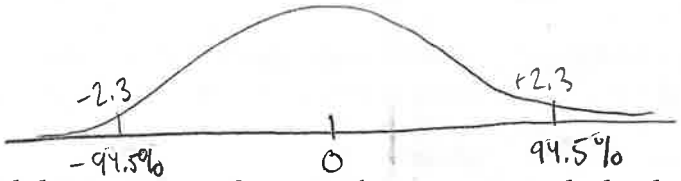
a) Write down a statistical model to test this relationship.

hourly-wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

For every year of age, hourly wage goes up by 0.85

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

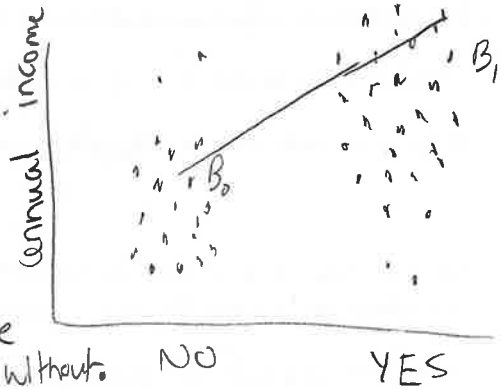


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

The annual wage of an employee without grad degrees is 45.2 thousand

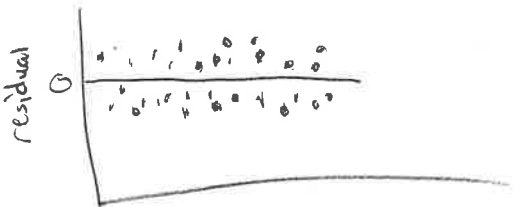
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

Employees with a graduate degree make on average 18.5K more annually than those without.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ■ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Saavi Sakhuja Student ID: 4737248.

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

S.S ✓ I will complete this MiniExam solely using my own work.
S.S ✓ I will not use any digital resources unless explicitly allowed by the instructor.
S.S ✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity score = β_0 + β_1 × location of workers (remote/office) + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 82 - 78 = 4$

d) What is the default null hypothesis for β_1? $\beta_1 = 0$. (slope = 0; there is no relationship b/w location of workers and productivity)

Q2. You want to test whether temperature (X) predicts ice cream sales (Y) using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

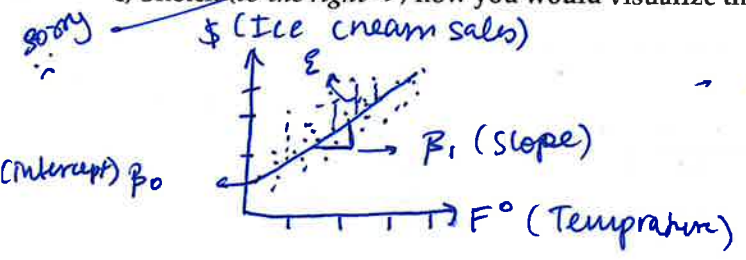
a) Write down a statistical model to test this question.

Ice cream sales (C$) = β_0 + β_1 × temp(F°) + ε

b) What part of your statistical model would indicate that temperature affects sales?

when $\beta \neq 0$ → or, when change in temperature affects sales.
coeff/slope ≠ 0

c) Sketch (*to the right* ->) how you would visualize this model.



sorry

→ as F° (temp) rises, the summer (heat) will drive more people to buy ice creams, raising number of sales of ice cream ($)

Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

hourly wages = β_0 + β_1 × age + ε

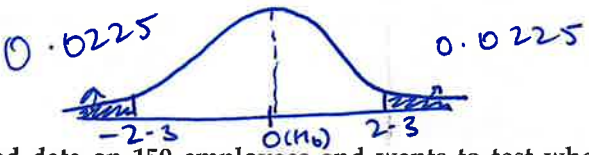
b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

$\beta_1 = 0.85$ indicates that with every increase in age, the hourly wage rate will rise or increase by 0.85 currency units (like 85 cents)

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

$\beta_1 = -2.3$

0.0225 + 0.0225 = 0.045

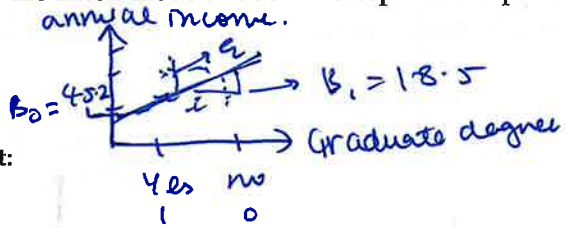


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

this means @ no graduate degree, annual income = 45,200

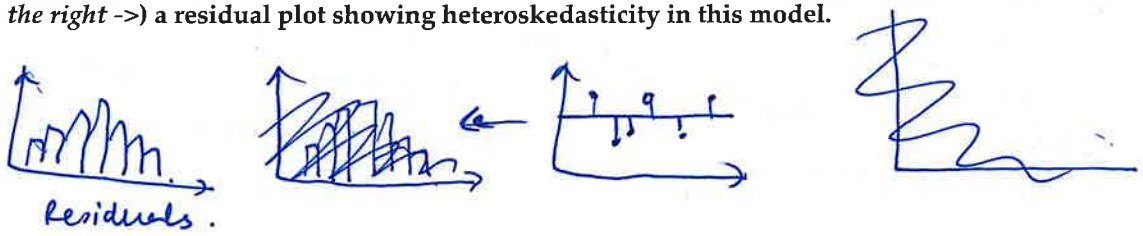
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

with every graduate degree taken, annual income increases by $18,500

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Lisa-Sophia Kacholava Student ID: 4818143

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

√ I will complete this MiniExam solely using my own work.
J I will not use any digital resources unless explicitly allowed by the instructor.
J I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

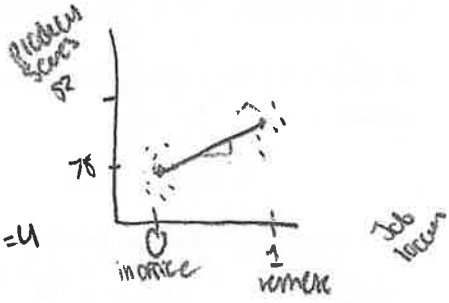
Productivity score = β_0 + β_1 × remote worker + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? 0

82 − 78 = 4



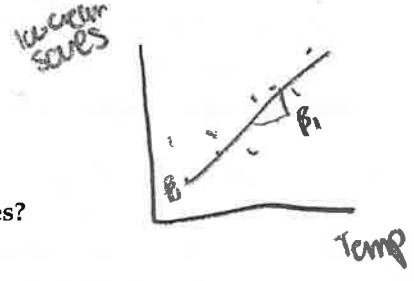
Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

a) Write down a statistical model to test this question.

Ice cream sales = β_0 + β_1 × Temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

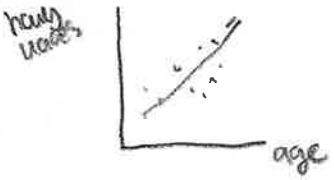


c) Sketch (*to the right* ->) how you would visualize this model.

Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

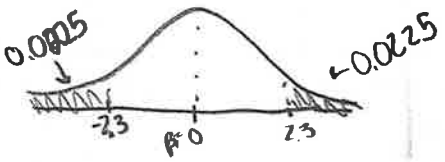
hourly_wage = β_0 + β_1 × age + ε



b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

hourly wages increase by 0.85 for every additional age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

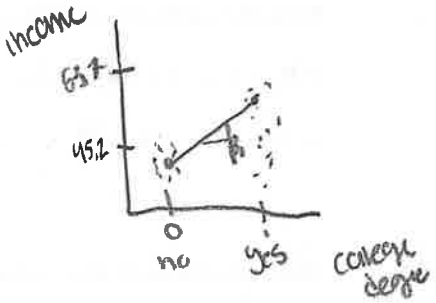


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

average income for employees without a college degree is 45.2

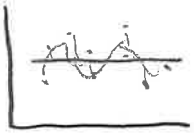
c) Interpret the coefficient on graduate_degree (18.50) in context:

income increases by 18.5 for those with a college degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Alina Chan Student ID: 4645883

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

AC I will complete this MiniExam solely using my own work.
AC I will not use any digital resources unless explicitly allowed by the instructor.
AC I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity score $= \beta_0 + \beta_1 \times$ location $+ \varepsilon$

b) Based on the information given, what would β_0 equal? β_0 = in-office

c) Based on the information given, what would β_1 equal? β_1 = remote

d) What is the default null hypothesis for β_1? accept

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

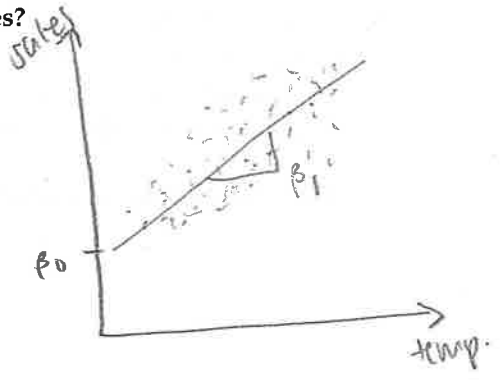
a) Write down a statistical model to test this question.

sales $= \beta_0 + \beta_1 \times$ temperature $+ \varepsilon$

b) What part of your statistical model would indicate that temperature affects sales?

β_1

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly wages using a sample of n=250 workers.

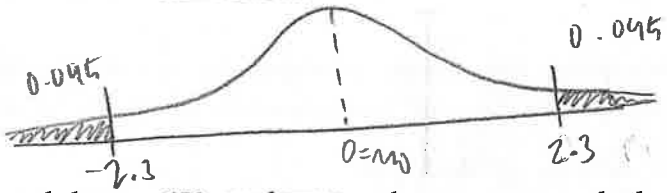
a) Write down a statistical model to test this relationship.

hourly wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

wages increase by 0.85 for every year they get older

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

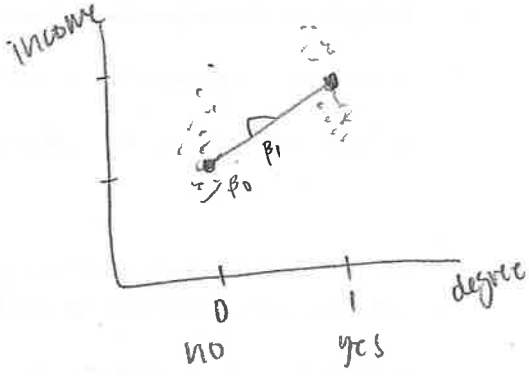


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	−45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

income for workers with no graduate degree is 45.20

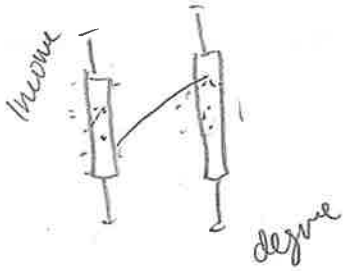
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

income increases by 18.50 for every additional graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Kyle Molz Student ID: 4660576

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

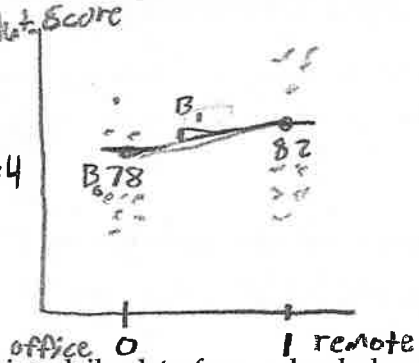
The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Prod_score = B_0 + B_1 × work_location + ε



b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 82 - 78 = 4$

d) What is the default null hypothesis for β_1? $B_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

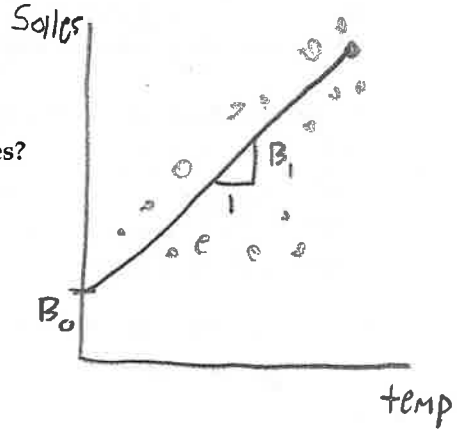
a) Write down a statistical model to test this question.

Sales = B_0 + B_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$B_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

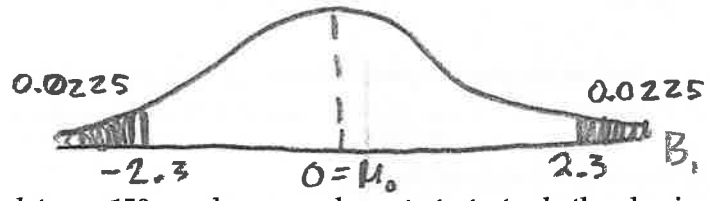
hourly_wages = B_0 + B_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

wages increase by 0.85 for every additional year in age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

$0.045/2 = 0.0225$

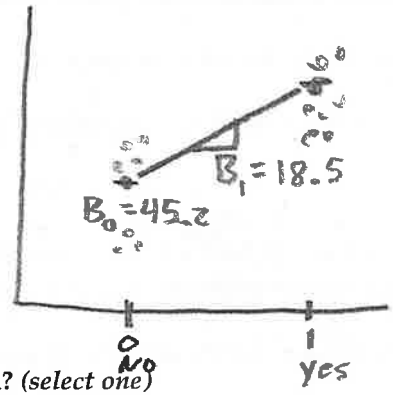


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Income with no grad degree is 45.2

c) Interpret the coefficient on graduate_degree (18.50) in context:

Income increased by 18.5 for people with a grad degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

□ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large

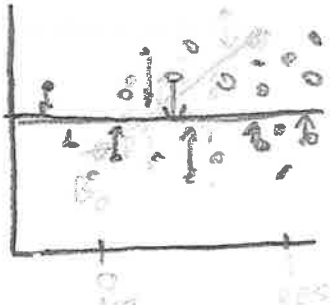
□ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero

□ Only 0.1% of the income difference between groups is due to random chance

□ There's a 99.9% probability that the true coefficient is at least 18.5

□ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Luke Thompson Student ID: 46521P6

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

LT I will complete this MiniExam solely using my own work.
LT I will not use any digital resources unless explicitly allowed by the instructor.
LT I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Prod Score = β_0 + β_1 × remote + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$ 82 - 78 = 4

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

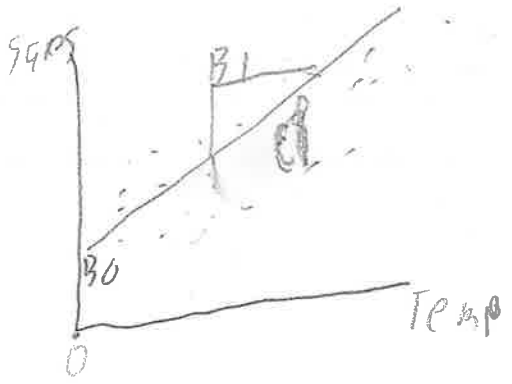
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × Temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

If $\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

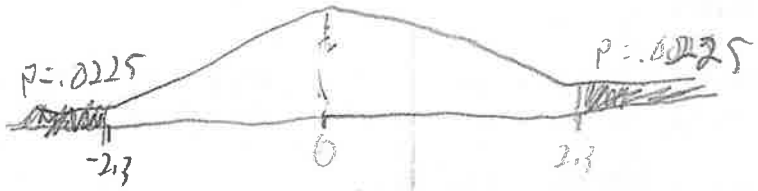
a) Write down a statistical model to test this relationship.

hourly_wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

For every 1 year older someone is, there predicted hourly wage increase by 1.85 dollars.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

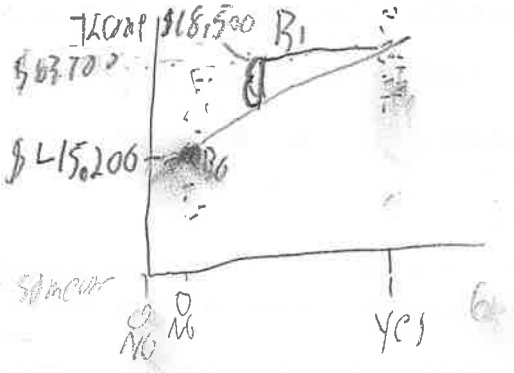


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

The average person with no grad degree has a annual income of $45,200

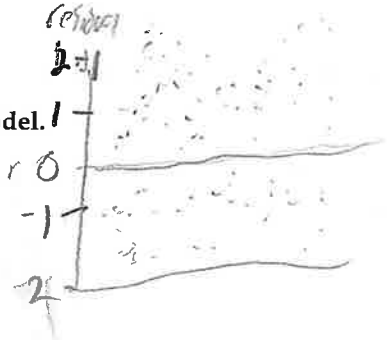
c) Interpret the coefficient on graduate_degree (18.50) in context:

The average increase in annual income with a grad degree compared to none, is $18,500

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- □ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ■ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- □ Only 0.1% of the income difference between groups is due to random chance
- □ There's a 99.9% probability that the true coefficient is at least 18.5
- □ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Luke Baumgbeck Student ID: 4614978

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

LB I will complete this MiniExam solely using my own work.
LB I will not use any digital resources unless explicitly allowed by the instructor.
LB I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

score = β_0 + β_1 × remote + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$ (82 − 78)

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

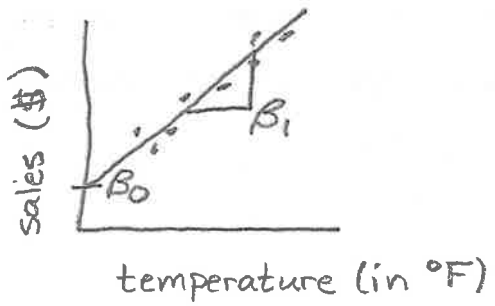
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

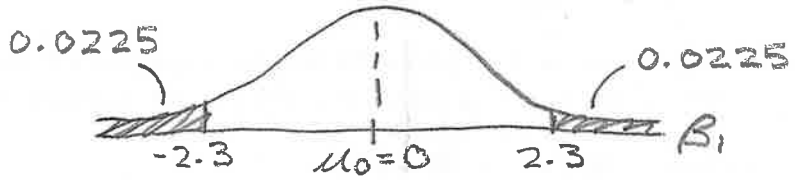
a) Write down a statistical model to test this relationship.

wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Hourly wages increase by 0.85 for every additional year in a worker's age.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

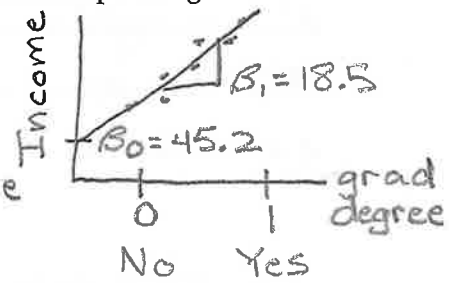


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

When an employee does not have a graduate degree, their annual income is $45,200.

c) Interpret the coefficient on `graduate_degree` (18.50) in context:

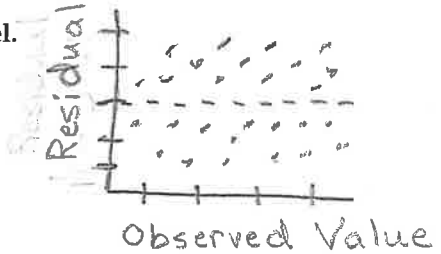
When an employee has a graduate degree, their annual income increases by $18,500 from the non-graduate degree salary.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☒ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☒ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☒ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Variance of residuals is constant over values, thus heteroskedasticity is satisfied.



Name: Isabella Ortega Student ID: 4653919

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

IO I will complete this MiniExam solely using my own work.
IO I will not use any digital resources unless explicitly allowed by the instructor.
IO I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity scores = β_0 + β_1 × workers (type) + E

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4

d) What is the default null hypothesis for β_1? $b_1 \neq 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

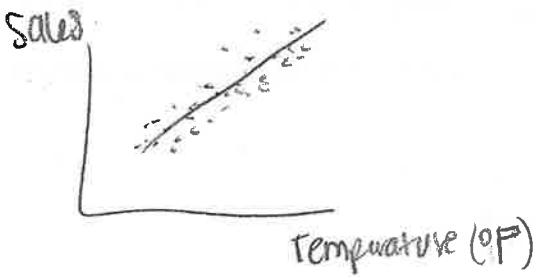
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × Temperature + E

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts `hourly_wages` using a sample of n=250 workers.

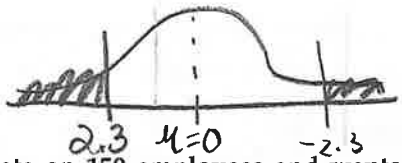
a) Write down a statistical model to test this relationship.

hourly_wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

hourly wages increase by 0.85 for every additional year of age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

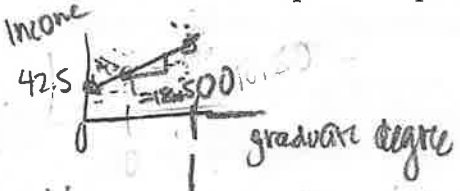


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

annual income for workers with no graduate degree is 45.20

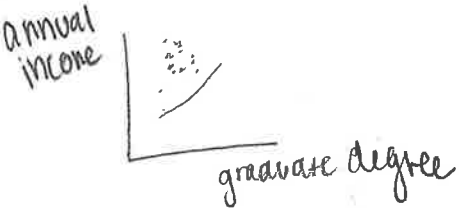
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

annual income increases by 18.50 if they have a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- □ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ● If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- □ Only 0.1% of the income difference between groups is due to random chance
- □ There's a 99.9% probability that the true coefficient is at least 18.5
- □ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Alex Paluso Student ID: 4648164

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

AP I will complete this MiniExam solely using my own work.
AP I will not use any digital resources unless explicitly allowed by the instructor.
AP I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Prod scores = β_0 + β_1 × remote workers + ε

b) Based on the information given, what would β_0 equal? β_0 = productivity for office workers

c) Based on the information given, what would β_1 equal? β_1 = difference between remote and in office

d) What is the default null hypothesis for β_1? ≥ 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

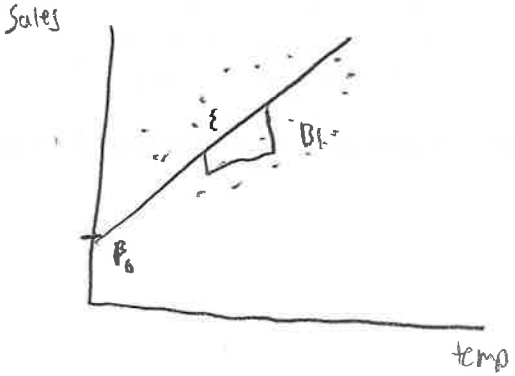
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether `age` predicts `hourly_wages` using a sample of n=250 workers.

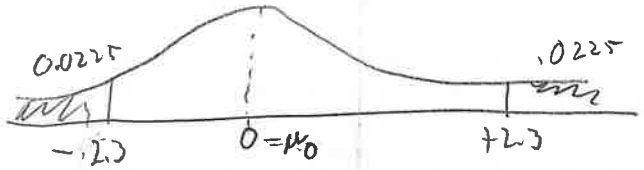
a) Write down a statistical model to test this relationship.

wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

for each 1-unit increase in log (age), wages increase by 0.85

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

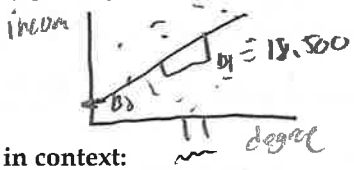


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Each additional increase in degree annual income increase by 45.2

c) Interpret the coefficient on `graduate_degree` (18.50) in context:

The positive coef means that there is a positive increase in outcome by 18.5

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

B

- [ ] Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- [x] If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- [ ] Only 0.1% of the income difference between groups is due to random chance
- [ ] There's a 99.9% probability that the true coefficient is at least 18.5
- [ ] The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.

Name: Ty Serakowski Student ID: 46436653

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

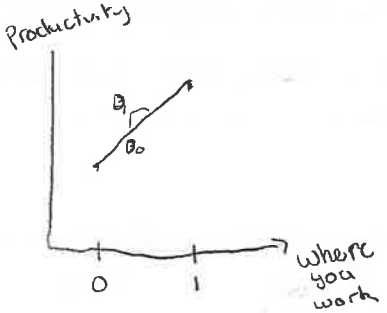
The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

TS I will complete this MiniExam solely using my own work.
TS I will not use any digital resources unless explicitly allowed by the instructor.
TS I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × workers + ε

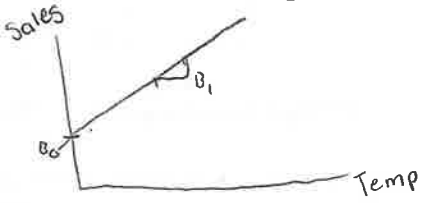


b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).



a) Write down a statistical model to test this question.

Ice cream sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.

Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

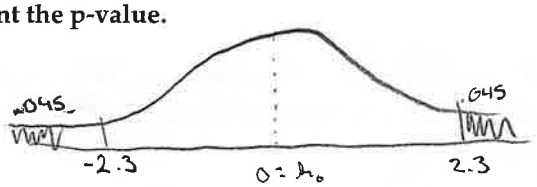
a) Write down a statistical model to test this relationship.

Hourly Wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Hourly wages increase by .85 for every additional year your age increases

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

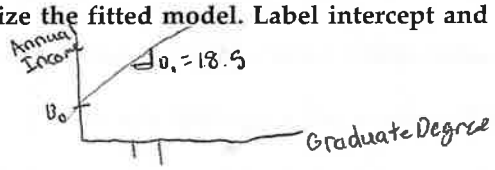


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Income for graduates with no degree is 45.2

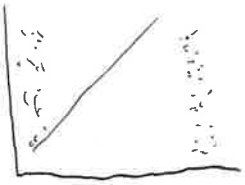
c) Interpret the coefficient on graduate_degree (18.50) in context:

Income increases by 18.5 for every graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

□ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
□ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
□ Only 0.1% of the income difference between groups is due to random chance
□ There's a 99.9% probability that the true coefficient is at least 18.5
□ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Lauren Stuccio Student ID: 46194490

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

LS I will complete this MiniExam solely using my own work.
LS I will not use any digital resources unless explicitly allowed by the instructor.
LS I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × workplace + ε

b) Based on the information given, what would β_0 equal? β_0 = in office workers

c) Based on the information given, what would β_1 equal? β_1 = remote workers

d) What is the default null hypothesis for β_1? 4

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

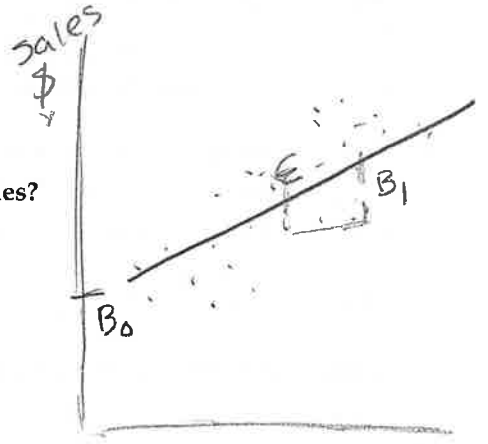
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temp. + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$, (positive or negative)

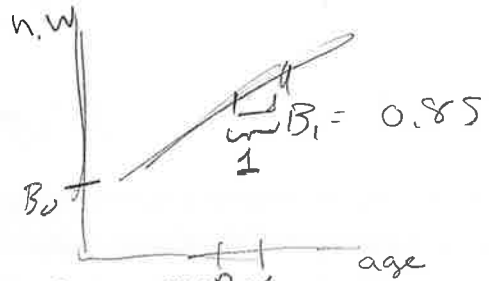
c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

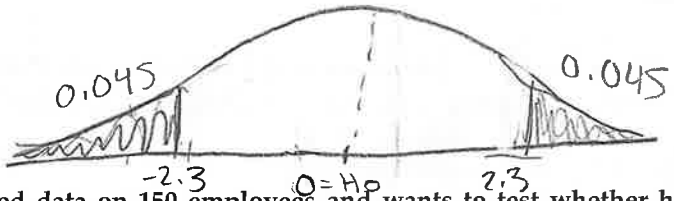
Wages = B_0 + B_1 × age + ε



b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Wages increase by 0.85 for every additional year in age

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.



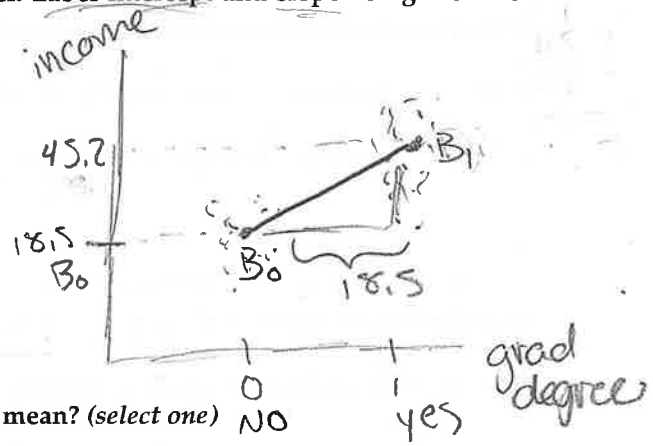
Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.

Done



b) Interpret the Intercept coefficient (45.20) in context:

Wages for people with no no degree start at 45.2

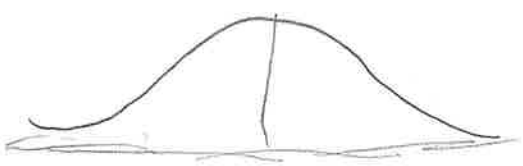
c) Interpret the coefficient on graduate_degree (18.50) in context:

Having a degree leads to a 18.5 increase in average annual income

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☐ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Joseph Ambroffi Student ID: 4693682

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

JA I will complete this MiniExam solely using my own work.
JA I will not use any digital resources unless explicitly allowed by the instructor.
JA I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

Productivity = β_0 + β_1 × WorkLocation + ε

b) Based on the information given, what would β_0 equal? $\beta_0 = 78$

c) Based on the information given, what would β_1 equal? $\beta_1 = 4$

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

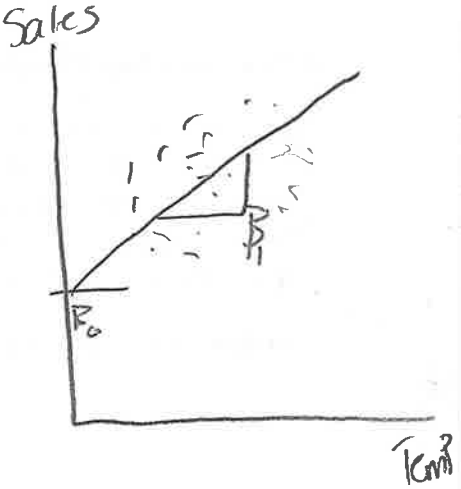
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × Temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts `hourly_wages` using a sample of n=250 workers.

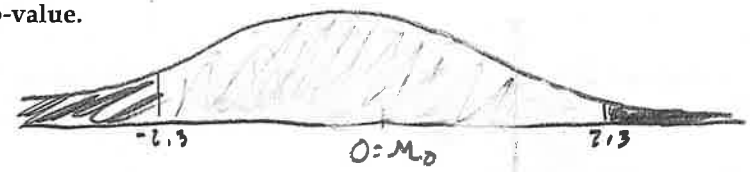
a) Write down a statistical model to test this relationship.

hourly_wage = β_0 + β_1 × Age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Wage for average age is .85

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

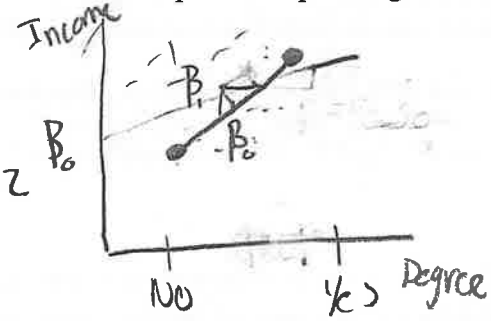


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: `graduate_degree` is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Wages for workers w/o graduate degree is 45.2

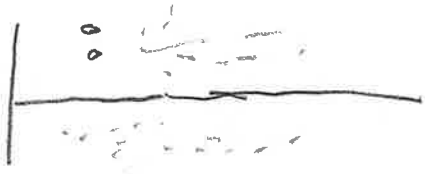
c) Interpret the coefficient on `graduate_degree` (18.50) in context:

Wages increase by 18.50 for graduate degree,

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ ~~Only 0.1% of the income difference between groups is due to random chance~~
- ☑ There's a 99.9% probability that the true coefficient is at least 18.5.
- ☐ ~~The coefficient of 18.5 has a 0.1% margin of error.~~

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: David Perkins Student ID: 4711921

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

DP I will complete this MiniExam solely using my own work.
DP I will not use any digital resources unless explicitly allowed by the instructor.
DP I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

remote = β_0 + β_1 × in-office + ε

b) Based on the information given, what would β_0 equal? β_0 = 78

c) Based on the information given, what would β_1 equal? β_1 = 4

d) What is the default null hypothesis for β_1? 0

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

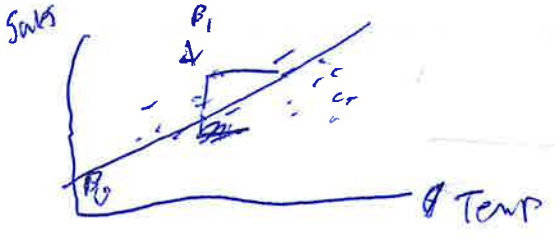
a) Write down a statistical model to test this question.

Sales = β_0 + β_1 × temp + ε

b) What part of your statistical model would indicate that temperature affects sales?

β_1 × temp

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

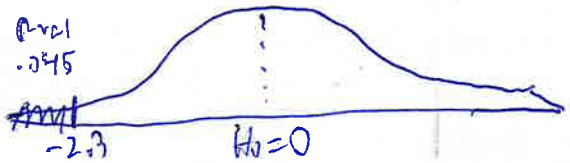
hourly wage = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

It would indicate for every additional year of age, hourly wage increases by 0.85.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

two sided?

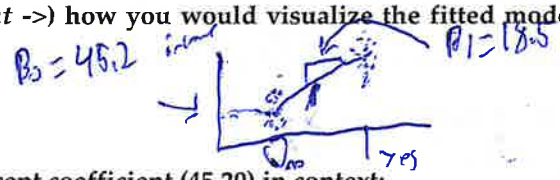


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

45.2 is the annual income we'd expect to see with no graduate degree.

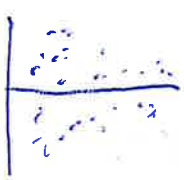
c) Interpret the coefficient on graduate_degree (18.50) in context:

Annual income increases, or increase, by 18.5 if you do have a graduate degree.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☑ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Riley Widdop Student ID: 46460592

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

RW I will complete this MiniExam solely using my own work.
RW I will not use any digital resources unless explicitly allowed by the instructor.
RW I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

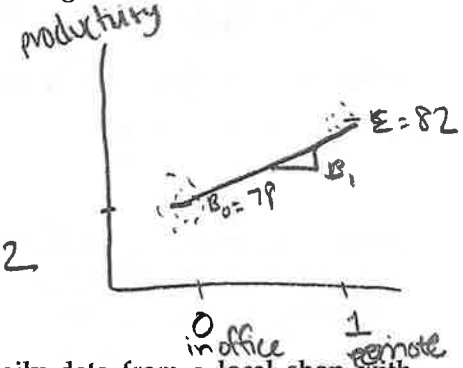
productivity = β_0 + β_1 × work place name vs work + ε

b) Based on the information given, what would β_0 equal? β_0 = 78

c) Based on the information given, what would β_1 equal? β_1 = 4

78 → 82

d) What is the default null hypothesis for β_1? 4



Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

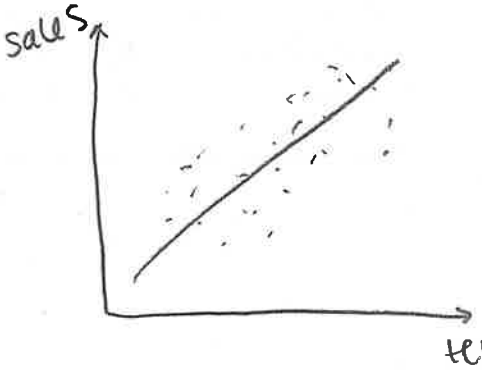
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

β_1/slope is positive
$\beta_1 > 0$

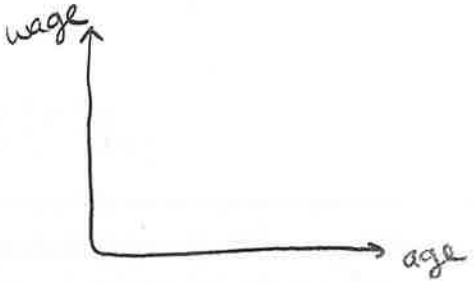
c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

a) Write down a statistical model to test this relationship.

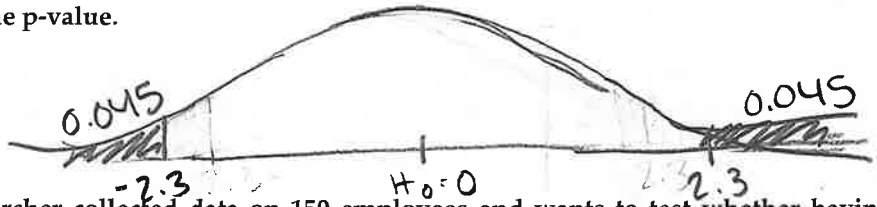
hourly wage = B_1 + B_0 × age + ε



b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

For every one unit increase in age, wages go up by 0.85 hourly.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.

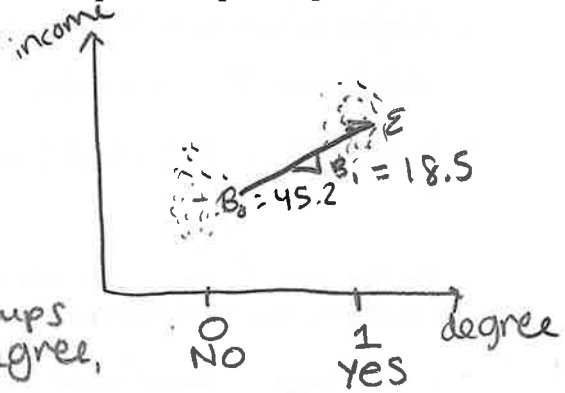


Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

This is the average income of those in the zero group, no college degree.

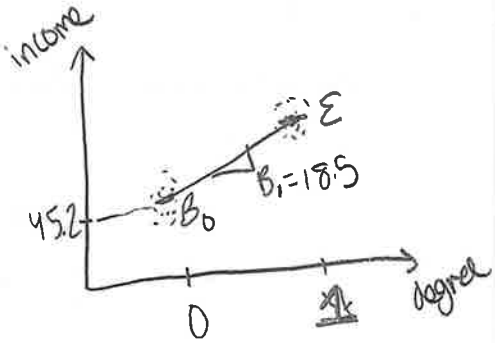
c) Interpret the coefficient on graduate_degree (18.50) in context:

This is the difference between the 0 → 1 groups average incomes. When you go to having a degree, you make on average 18,500 more.

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☐ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.



Name: Ava Carragher Student ID: 4621779

ECON 0150 | MiniExam 4 | Fall 2025

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

AC I will complete this MiniExam solely using my own work.
AC I will not use any digital resources unless explicitly allowed by the instructor.
AC I will not communicate directly or indirectly with others during the MiniExam.

Q1. A study uses data from 80 employees to examine whether remote workers have different productivity scores than in-office workers. Remote workers have an average productivity score of 82 and in-office workers have an average score of 78.

a) If we code `remote` as 1 for remote workers and 0 for in-office workers, write the regression model:

productivity = 78 (β_0) + 4 (β_1) × remote or in-office + ε

b) Based on the information given, what would β_0 equal? $\beta_0 =$ 78

82 − 78 = 4

c) Based on the information given, what would β_1 equal? $\beta_1 =$ 4

d) What is the default null hypothesis for β_1? $\beta_1 = 0$

Q2. You want to test whether temperature predicts ice cream sales using daily data from a local shop with variables `temperature` (in °F) and `sales` (in dollars).

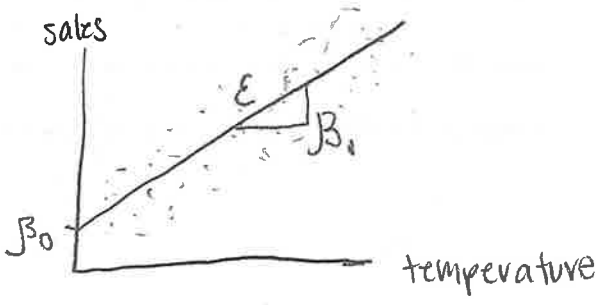
a) Write down a statistical model to test this question.

sales = β_0 + β_1 × temperature + ε

b) What part of your statistical model would indicate that temperature affects sales?

$\beta_1 \neq 0$

c) Sketch (*to the right* ->) how you would visualize this model.



Q3. You want to examine whether age predicts hourly_wages using a sample of n=250 workers.

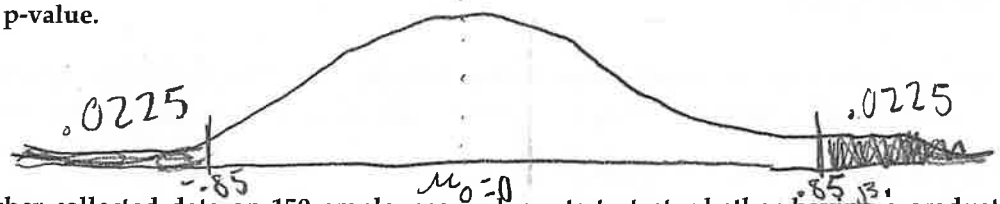
a) Write down a statistical model to test this relationship.

hourly_wages = β_0 + β_1 × age + ε

b) If your regression yields $\beta_1 = 0.85$, interpret this coefficient in context:

Hourly wages increase by 0.85 for every additional year of age.

Q4. Draw the sampling distribution under the null hypothesis (H_0: $\beta_1 = 0$) for a slope coefficient that has an observed value of -2.3 with a p-value of 0.045. Mark our observed coefficient and shade the region(s) that represent the p-value.



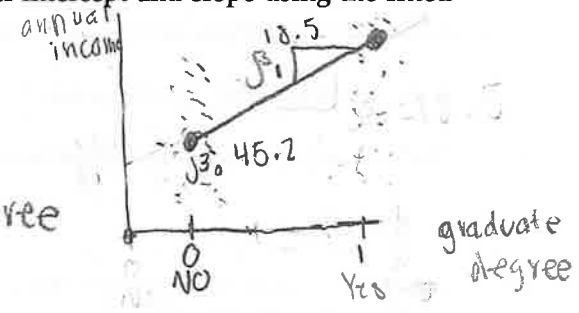
.0225
.0225
.045

Q5. A researcher collected data on 150 employees and wants to test whether having a graduate degree affects annual income. The regression output shows:

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	45.200	2.100	21.524	0.000	41.044	49.356
graduate_degree	18.500	5.250	3.524	0.001	8.129	28.871

Note: graduate_degree is coded as 1 = Yes, 0 = No; income is in thousands of dollars.

a) Sketch (*to the right* ->) how you would visualize the fitted model. Label intercept and slope using the fitted values.



b) Interpret the Intercept coefficient (45.20) in context:

Annual Income for people with no graduate degree

c) Interpret the coefficient on graduate_degree (18.50) in context:

Annual income increases by 18.5 for having a graduate degree

d) What does the p-value of 0.001 for the graduate_degree coefficient mean? *(select one)*

- ☐ Out of 1000 samples where graduate degrees truly matter, only 1 would show a coefficient this large
- ☒ If graduate degrees are unrelated to income, 0.1% of samples would have a coefficient this far from zero
- ☐ Only 0.1% of the income difference between groups is due to random chance
- ☐ There's a 99.9% probability that the true coefficient is at least 18.5
- ☐ The coefficient of 18.5 has a 0.1% margin of error

e) Sketch (*to the right* ->) a residual plot showing heteroskedasticity in this model.