✓ **Congratulations! You passed!**
TO PASS 80% or higher

[Keep Learning]

GRADE
100%

Logistic Regression Quiz

LATEST SUBMISSION GRADE

100%

1. **Imagine that you are collecting variables while participants attempted to shoot a soccer ball. Which of the following collected variables could be predicted using a logistic regression model?**

   `1 / 1 point`

   ☐ Age (years)

   ☑ Scoring a soccer goal on a given shot

   > ✓ **Correct**

   ☐ Height

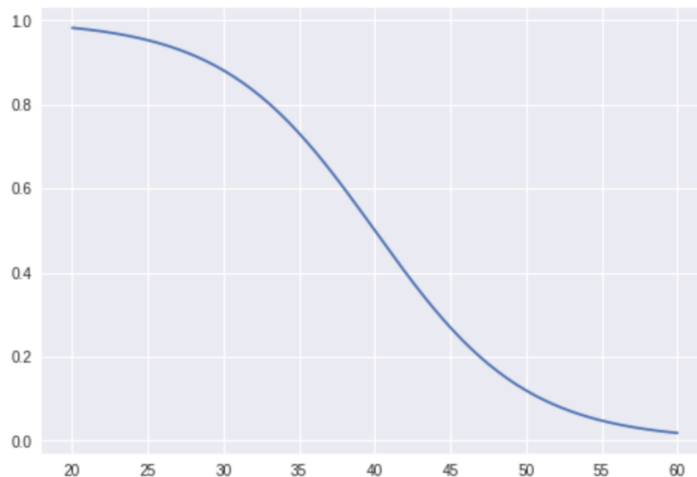   ☑ Sex (male vs. female)

   > ✓ **Correct**

   ☑ Whether a shot on goal traveled more than 20 feet

   > ✓ **Correct**

2. **Which of the following is a possible form/shape for a logistic regression model, where the y-axis represents the probability of success?**
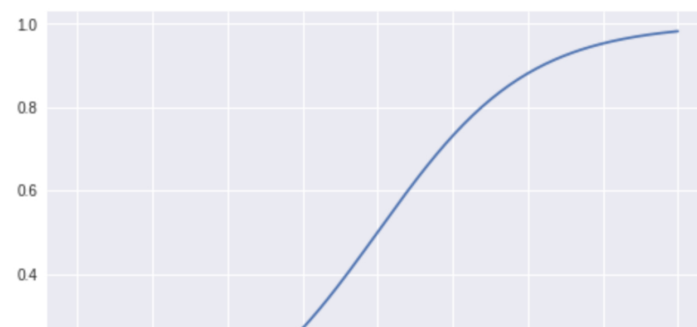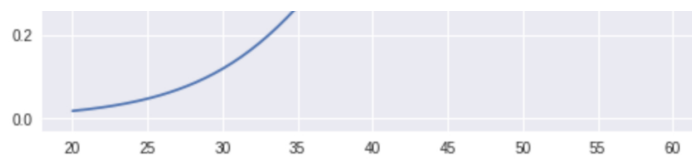
   `1 / 1 point`

   ☑ Graph:

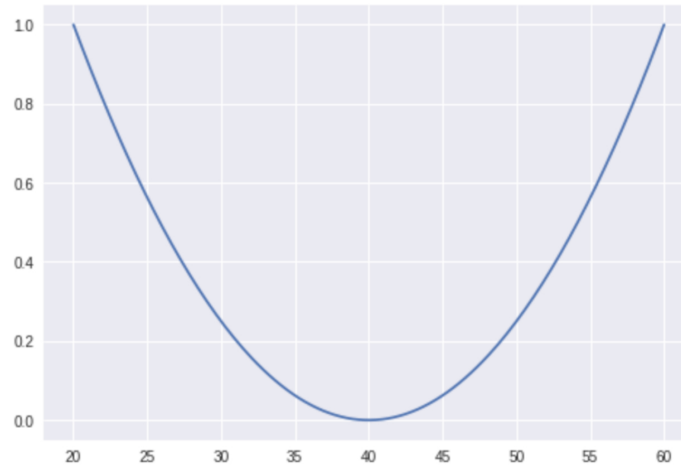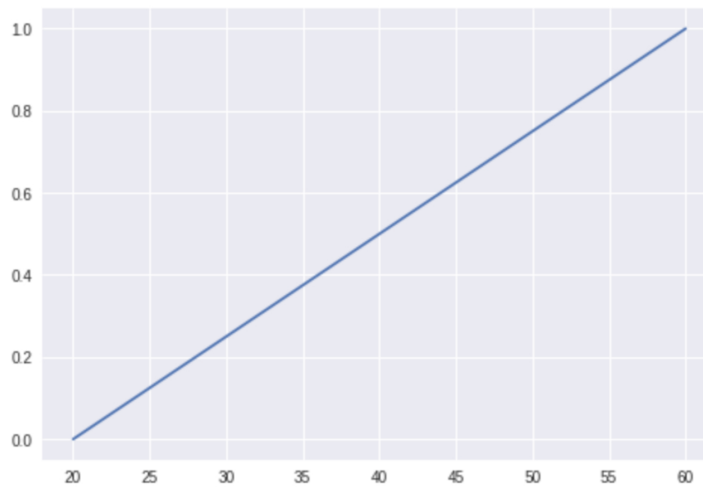
   > ✓ **Correct**

   ☑ Graph:

✓ **Correct**

☐ Graph:

☐ Graph:

3. **Two probabilities have been transformed using the logit function. The two values after transformation are -2 and 0.25. Which of the two values corresponds to a higher original probability?**   `1 / 1 point`

- ○ -2
- ⦿ 0.25
- ○ They are the same
- ○ Can't tell

✓ **Correct**

4. **NHANES records whether an individual has smoked 100 cigarettes or more. The next few questions will focus on fitting models to predict whether someone has smoked 100+ cigarettes.**   `1 / 1 point`

First, a model is fit using body mass index (BMI) as the variable to predict smoking status. The output is here:

	coef	std err	z	P>|z|	[0.025	0.975]
Intercept	-0.4219	0.123	-3.426	0.001	-0.663	-0.181

| | BMI | 0.0037 | 0.004 | 0.911 | 0.362 | -0.004 | 0.012 |

What does the coefficient of 0.0037 mean?

○ For each increase by one in BMI, the probability of smoking 100 cigarettes increases by about 0.0037, on average.

○ For each increase by one in BMI, the odds of smoking 100 cigarettes increases by about 0.0037, on average.

◉ For each increase in one in BMI, the log odds of smoking 100 cigarettes increases by about 0.0037, on average.

○ For each increase in one in BMI, the odds of smoking 100 cigarettes increases multiplicatively by about 0.0037, on average.

✓ Correct

---

5. Next, a model is fit adding Age as an additional covariate to BMI as the variables predicting smoking status. The output is here:

1 / 1 point

	coef	std err	z	P>|z|	[0.025	0.975]
Intercept	-1.2435	0.149	-8.366	0.000	-1.535	-0.952
BMI	0.0030	0.004	0.718	0.472	-0.005	0.011
Age	0.0169	0.002	10.349	0.000	0.014	0.020

What does the coefficient of 0.0169 mean in context?

○ For each increase of one in BMI, the odds of smoking 100 cigarettes increases by about 0.0169, on average.

○ For each increase of one in Age, the odds of smoking 100 cigarettes increases by about 0.0169, on average.

○ For each increase of one in Age, the log odds of smoking 100 cigarettes increases by about 0.0169, on average.

◉ For each increase of one in Age, the log odds of smoking 100 cigarettes increases by about 0.0169 while holding BMI constant, on average.

✓ Correct

---

6. **Based on the logistic regression with both Age and BMI as covariates, are the coefficients statistically significant at a two-sided 10% significance level?**

1 / 1 point

	coef	std err	z	P>|z|	[0.025	0.975]
Intercept	-1.2435	0.149	-8.366	0.000	-1.535	-0.952
BMI	0.0030	0.004	0.718	0.472	-0.005	0.011
Age	0.0169	0.002	10.349	0.000	0.014	0.020

○ Both coefficients are significant

○ Neither coefficient is significant

○ Only the coefficient for BMI is significant

◉ Only the coefficient for Age is significant

✓ Correct

---

7. **The 95% confidence interval for the coefficient for Age is given above as (0.014, 0.020). If instead we wanted a 90% confidence interval, how would the width of the interval change?**

1 / 1 point

○ It would be wider

◉ It would be narrower

○ It would stay the same

○ Can't tell

✓ Correct

---

8. **We'd like to predict the log odds of smoking 100+ cigarettes for a given individual using the logistic regression model with the two variables: BMI and Age. For an individual with a BMI of 22 who is 45 years old, what would the predicted log odds be?**

1 / 1 point

	coef	std err	z	P>|z|	[0.025	0.975]
Intercept	-1.2435	0.149	-8.366	0.000	-1.535	-0.952
BMI	0.0030	0.004	0.718	0.472	-0.005	0.011

Age   0.0169   0.002   10.349   0.000   0.014   0.020

- ⦿ -0.417
- ○ 0.8265
- ○ 0.327
- ○ -0.7367
- ○ Can't tell

✓ **Correct**

---

9. **The sample of adults surveyed in NHANES contains adults age 20-80 with BMIs of 14.5-64.6. For the individual with a BMI of 22 who is 45 years old, do you trust the predicted log odds calculated above as being reasonable?**   `1 / 1 point`

- ○ No, this is extrapolation
- ○ No, this is interpolation
- ○ Yes, this is extrapolation
- ⦿ Yes, this is interpolation

✓ **Correct**

---

10. **Fill in the blanks. With 95% confidence, I estimate that the increase in log odds of smoking 100+ cigarettes for each increase by one in BMI, while holding Age constant, is between ___ and ___, on average.**   `1 / 1 point`

	coef	std err	z	P>|z|	[0.025	0.975]
Intercept	-1.2435	0.149	-8.366	0.000	-1.535	-0.952
BMI	0.0030	0.004	0.718	0.472	-0.005	0.011
Age	0.0169	0.002	10.349	0.000	0.014	0.020

- ○ -1.2435 and 0.149
- ○ 0.014 and 0.020
- ○ -1.535 and -0.952
- ⦿ -0.005 and 0.011
- ○ Can't tell

✓ **Correct**