

1) The Mid-September statewide average gas prices, in dollars per gallon, for some years are given below

Year	2000	2001	2002	2003
Price Per Gallon	1.345	1.408	1.537	1.58

a) write a linear regression equation for the set of data. Round off all coefficients to the nearest ^{ten thousandth} hundredth.

$$y = ax + b$$

$$a = .0834$$

$$b = -165.4576$$

$$r = .9824282494$$

$$y = .0834x - 165.4576$$

$$y = .0834x - 165.4576$$

b) What is the correlation coefficient, rounded off to the nearest thousandth for this linear model?

Does this coefficient suggest a strong or weak relation between the year and the gas prices? Explain.

$r \approx .982$ and it suggests a strong relation between the variables because it is very close to 1

c) Predict the average gas price for the year 2017. Round off to the nearest cents.

$$y = .08(2017) - 165.48$$

$$y = .0834(2017) - 165.4576$$

$$y = 2.7602 \approx 2.76$$

d) Predict the year in which the average gas price will first be \$3 per gallon

$$3 = 0.0834x - 165.4576$$

$$+ 165.4576$$

$$+ 165.4576$$

$$x = 2019.8753 \approx 2020$$

2) Given the following set of data

35, 24, 32, 36, 40, 32, 40, 38, 36, 33, 11, 20, 19, 22, 8

a) Find the mode, median, mean, 1st quartile, 3rd quartile, range and interquartile range for the data set

mean, $\bar{x} = 28.4$

$Q1 = 20$

Range: $40 - 8 = 32$

mode: 32, 36, 40

$Q3 = 36$

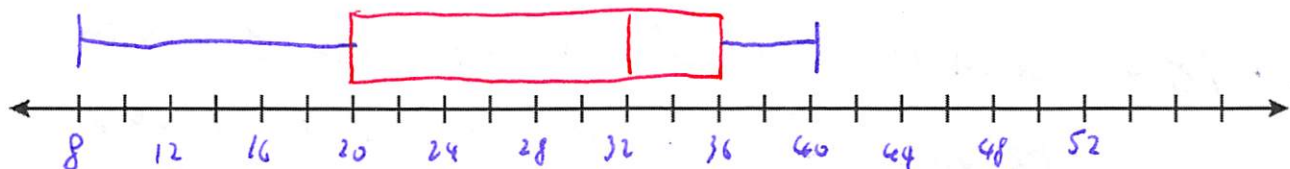
IR: $36 - 20 = 16$

median: 32

min = 8

max = 40

b) Using the information found in (a), draw a box-and-whisker plot for the data set.

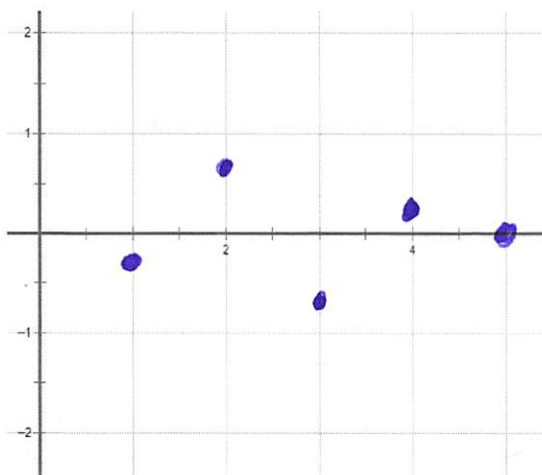


3) A residual table for the line of best fit for a data set is given below.

x	1	2	3	4	5
Residuals	-0.2	0.6	-0.6	0.2	0

a) draw a residual plot for this data set.

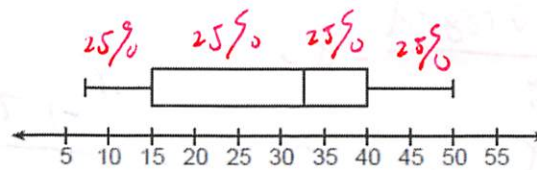
b) Base on the residual plot, is this line a good fit? Explain



The line is a good fit because its residual plot does not have an obvious pattern.

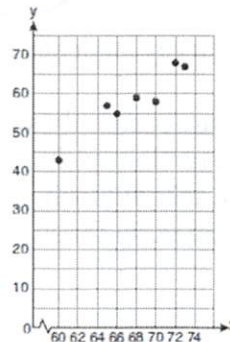
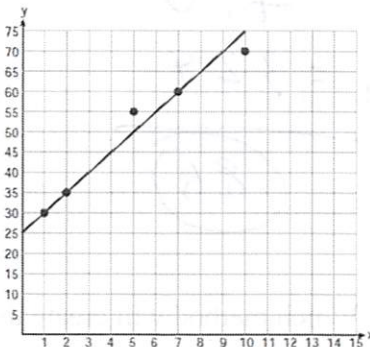
- 1) The box-and-whisker plot represents the ages of 12 people. What percent of these people are age 15 or older?

a) 25 b) 35 **c) 75** d) 80



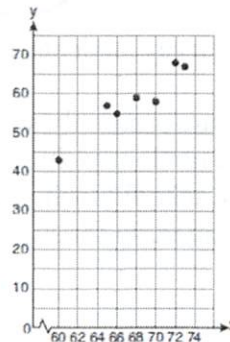
- 2) What is the equation of the line of best fit for the following scatter plot?

a) $y = x + 5$ b) $y = x + 25$ c) $y = 5x + 5$ **d) $y = 5x + 25$**



- 3) Which is true about the scatter plot shown below?

a) the scatter plot shows no correlation
b) the scatter plot shows positive correlation
 c) the scatter plot shows negative correlation
 d) the scatter plot shows undefined correlation



- 4) Look at the cumulative frequency table given below. Which 10-minute interval contains the first quartile?

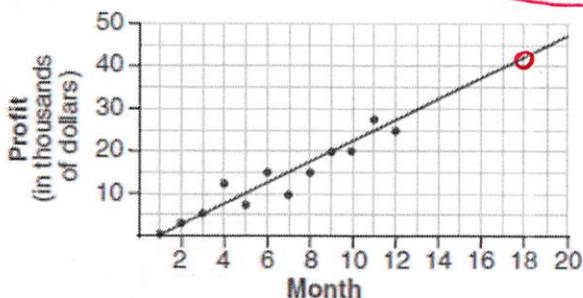
a) 31 – 40 b) 41 – 50 **c) 51 – 60** d) 61 – 70

Minutes Used	Cumulative Frequency
31–40	2
41–50	5
51–60	10
61–70	19
71–80	30

31-40	2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	...	30
41-50	3																						
51-60	5																						
61-70	9																						
71-80	11																						

- 5) The following scatter shows the profit for a company for the first 12 months of its operation. Katie draws a line of best fit for these data. According to this line, the best estimate of the profit for the 18th month is

a) \$35,000 b) \$37,750 **c) \$42,500** d) \$45,000



- 6-a) Jade's test grades for the first 4 tests are 78, 90, 80, 88. The 5th test is coming up and Jade wants to pull her test average to 85. What is the minimum grade she needs to get on the 5th test to achieve her goal?

$$\frac{78 + 90 + 80 + 88 + x}{5} = 85$$

$$\frac{336 + x}{5} = 85, \quad x = 89$$

or $85 \times 5 = 425$ total points she needs
 $78 + 90 + 80 + 88 = 336$ total point she has now
 $425 - 336 = 89$

- b) Jade's test average on her first 4 math tests is 81. If she wants to pull her average to 82, what is the minimum grade she needs to get on the next test?

$$\frac{(4 \times 81) + x}{5} = 82$$

$$\frac{324 + x}{5} = 82, \quad x = 86$$

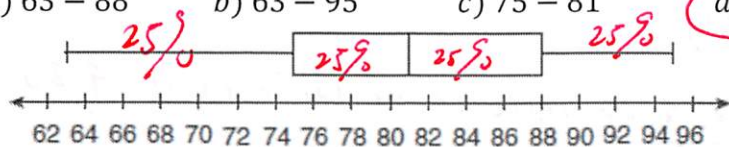
$82 \times 5 = 410$
 or $81 \times 4 = 324$
 $410 - 324 = 86$

- 7) A school newspaper will survey students about the quality of school lunch. Which method will create the *least* biased results

- a) twenty five vegetarians are randomly surveyed
☒ b) twenty five students are randomly chosen from each grad level
 c) students who dislike the school lunch program are surveyed
 d) a booth is set up in the cafeteria for students who voluntarily complete the survey

- 8) Based on the line of best fit drawn, which interval contains 50% of the data?

- a) 63 - 88 b) 63 - 95 c) 75 - 81 ☒ d) 75 - 88



- 9) The scatter plot above shows the number of acres used for farming in a small town over several years. Using the line of best fit, how many acres will be used for farming in the 5th year?

- a) 0 ☒ b) 200 c) 300 d) 400

