x = 8

Subject:

No:

Date:

1. a) i) $y = 4 + 2x$, $x = 3$

$y = 4 + 2(3)$

$y = 4 + 6$

$y = 10$

ii) $y = 3x$, $x = 5$

$y = 3(5)$

$y = 15$

iii) $y = a + bx$, $a = 2$, $b = 4$, $x = 12$

$y = 2 + (4)(12)$

$y = 2 + 48$

$y = 50$

iv) $y = \frac{x - a}{b}$, $x = 2$, $a = -4$, $b = 4$

$y = \frac{2 - (-4)}{4}$

$= \frac{6}{4}$

$= \frac{3}{2} = 1.5$

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b) i) The proportion that a six is rolled on a dice is $\frac{4}{20} = 0.2$.

ii) The proportion of puppies advertised on Gumtree were free is $\frac{46}{200} = 0.23$.

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c) i) $y = a + bx$, $a =$ \$100 (hire cost)

$b =$ \$1.7 (per kilometre cost).

The total cost , $y = 100 + 1.7x$.

ii) $x = 80$, $y = 100 + 1.7x$ $\Rightarrow$ The total cost for 80 km

$y = 100 + 1.7(80)$ is \$236.

$= 100 + 136$

$= 236$

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iii) $x = 0$ km, $y = 110 + 1.7x$

$y = 110 + 1.7(0)$

$y = 110$

$\Rightarrow$ The total cost of only sitting in the car without any mileage is $110.

Q2 :

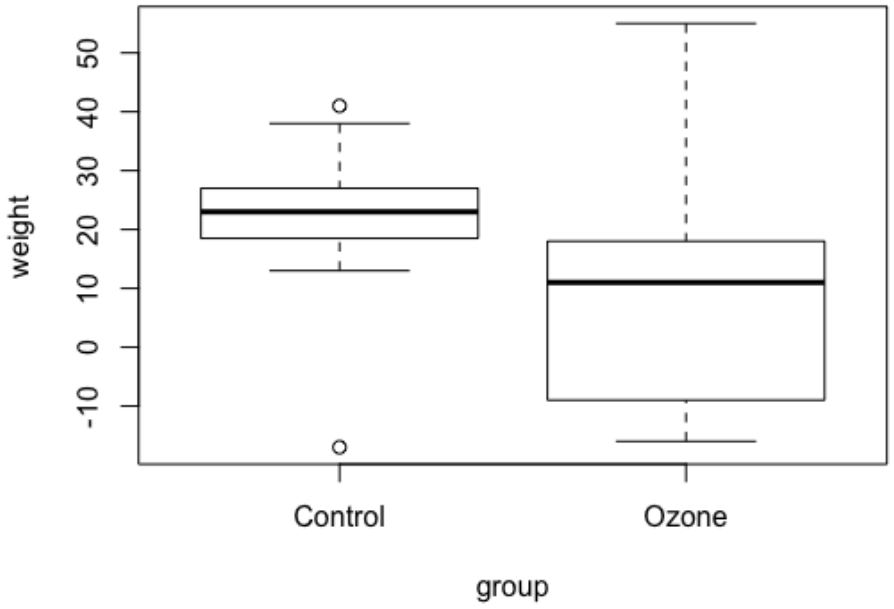
a) The subjects are the 70-day-old rats and there are 45 of them.

b) There are two variables where one is the group of the rats and the other one is the weight gain of the rats. The group of the rats consists of a control group and ozone group and its variable type is categorical nominal. On the other hand, the variable type for the weight gain of the rats is quantitative continuous as it a measured variable.

c) The sample mean weight gain of all the rats is 16.8 gram.

d) The standard deviation of the weight gain of all the rats is 16.280 gram.

e) The minimum weight gain of all the rats is –17 gram and the maximum weight gain of all the rats is 55 gram.



f)

1. This is a box-plot.
2. The two variables are weight and group.
3. The subjects are 70-day-old rats.
4. The dataset of this case study ranges from 55 gram to –17 gram of weight gain.
5. One interesting feature that is immediately apparent to me is the variability of each group's interquartile range (IQR). The control group clearly has a much less variable spread than that of the ozone group.

i. The control group has the highest median weight gain than the ozone group.

ii. The ozone group has the largest interquartile range (IQR) among the two groups.

iii. Yes, there are two potential outliers in the dataset of the control group. Based on the formula of 1.5*IQR, any value that is greater than 40.5 gram or smaller than 4.5 gram is considered the outlier of the control group. Therefore, the outliers are 41 gram and –17 gram of the weight gain of all the rats in the control group.

iv. Overall, I think that the exposure to ozone causes weight loss in rats because the median and interquartile range of the weight of the rats in the ozone group is lower than that of the control group.

Q3 :

a) The number of zombies in the first 24 hours of the zombie apocalypse is a quantitative discrete variable.
b) The daily maximum temperature of Adelaide is a quantitative continuous variable.
c) The types of cocktails are a categorical nominal variable.