

Solutions to the Final Exam Review – Unit 4

① ~~36, 39, 58, 42, 106, 39, 48, 45~~

36, 39, 39, 42, 45, 48, 58, 106

$$\text{mean} = \frac{413}{8} = \boxed{51.625}$$

$$\text{median} = \frac{42 + 45}{2} = \frac{87}{2} = \boxed{43.5}$$

$$\text{mode} = \boxed{39}$$

② ~~50, 55, 60, 58, 62, 57, 68, 51, 63~~

50, 51, 55, 57, 58, 60, 62, 63, 68

$$\text{mean} = \frac{524}{9} = \boxed{58.\bar{2}}$$

$$\text{median} = \boxed{58}$$

$$\text{mode} = \boxed{\text{no mode}}$$

$$\textcircled{3} \quad Q1 = \boxed{39} \quad Q3 = \frac{48 + 58}{2} = \boxed{53}$$

$$IQR = 53 - 39 = \boxed{14}$$

$$\text{minimum} = \boxed{36} \quad \text{maximum} = \boxed{106}$$

$$\text{Range} = 106 - 36 = \boxed{70}$$

MAD

$$\bar{x} = 51.6$$

$$36 - 51.6 = -15.6$$

$$39 - 51.6 = -12.6$$

$$39 - 51.6 = -12.6$$

$$42 - 51.6 = -9.6$$

$$45 - 51.6 = -6.6$$

$$48 - 51.6 = -3.6$$

$$58 - 51.6 = 6.4$$

$$106 - 51.6 = 54.4$$

$$(15.6 + 12.6 + 12.6 + 9.6 + 6.6 + 3.6 + 6.4 + 54.4) / 8$$

$$= \frac{121.4}{8}$$

$$MAD = \boxed{15.175}$$

$$\textcircled{4} \quad Q1 = \frac{51 + 55}{2} = \boxed{53}$$

$$Q3 = \frac{62 + 63}{2} = \boxed{62.5}$$

$$IQR = 62.5 - 53 = \boxed{9.5}$$

$$\text{Minimum} = \boxed{50}$$

$$\text{Maximum} = \boxed{68}$$

$$\text{Range} = 68 - 50 = \boxed{18}$$

MAD
 $\bar{x} = 58.2$

$$50 - 58.2 = -8.2$$

$$51 - 58.2 = -7.2$$

$$55 - 58.2 = -3.2$$

$$57 - 58.2 = -1.2$$

$$58 - 58.2 = -0.2$$

$$60 - 58.2 = 1.8$$

$$62 - 58.2 = 3.8$$

$$63 - 58.2 = 4.8$$

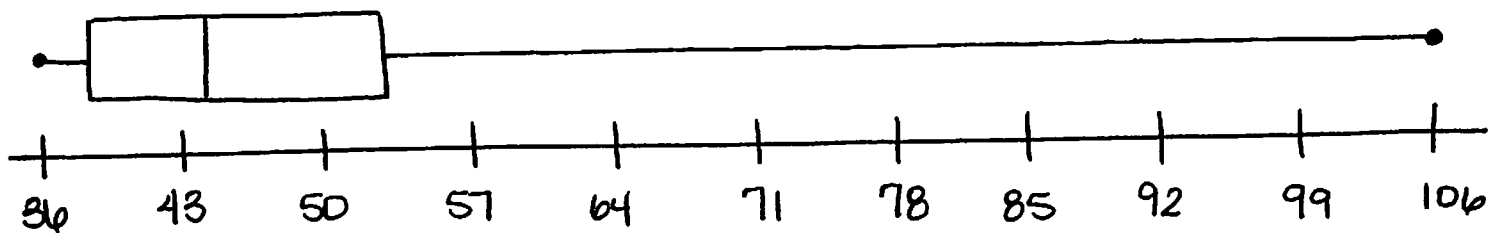
$$68 - 58.2 = 9.8$$

$$(8.2 + 7.2 + 3.2 + 1.2 + 0.2 + 1.8 + 3.8 + 4.8 + 9.8) / 9$$

$$= \frac{40.2}{9}$$

$$\text{MAD} = \boxed{4.4\bar{6}}$$

⑤ data from #1



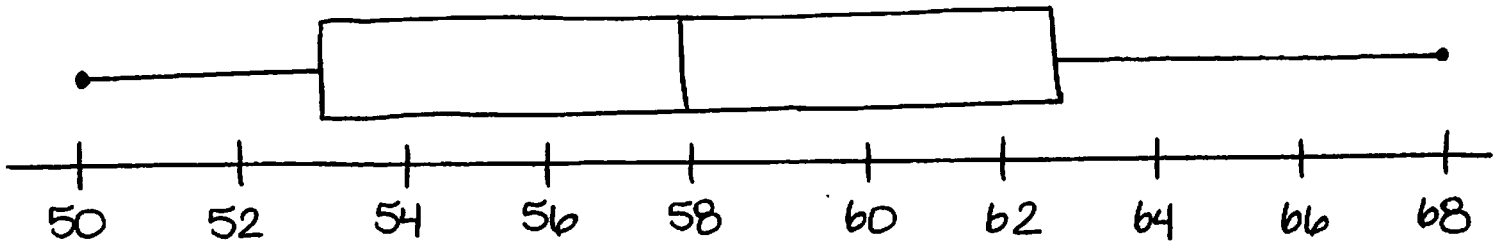
check for outliers:

$$Q1 - 1.5(IQR) = 39 - 1.5(14) = 18$$

$$Q3 + 1.5(IQR) = 53 + 1.5(14) = 74$$

yes, 106 is an outlier.

data from #2



check for outliers:

$$Q1 - 1.5(IQR) = 53 - 1.5(9.5) = 38.75$$

$$Q3 + 1.5(IQR) = 62.5 + 1.5(9.5) = 76.75$$

No outliers.

⑦ positive - no causation

⑧ no correlation - no causation

⑨ negative - no causation

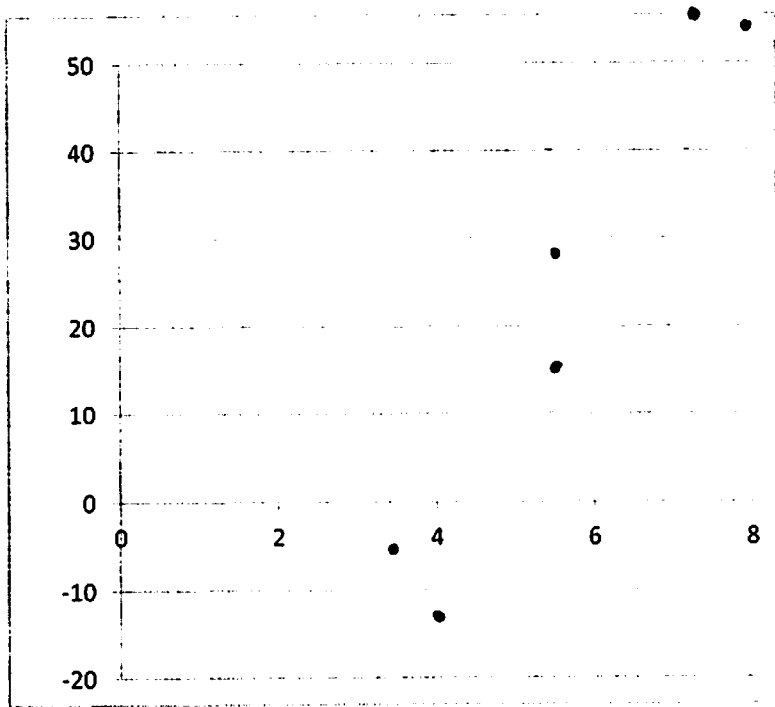
⑩ positive or no correlation - no causation

⑪ $y = -13.72x + 130.28$ $r = -0.97$

yes

⑫

Price	Actual	Predicted	Residuals
4.00	63	75.4	-12.4
5.50	70	54.8	15.2
3.50	77	82.3	-5.3
8.00	75	20.5	54.5
5.50	84	54.8	29.2
7.00	90	34.2	55.8



NO

There is a pattern.

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$$(0, 3)$$

$$y = ab^x$$

$$3 = ab^0$$

$$3 = a(1)$$

$$3 = a$$

$$a = 3$$

$$(4, 11)$$

$$y = ab^x$$

$$11 = ab^4$$

$$\frac{11}{3} = \frac{\cancel{3}b^4}{\cancel{3}}$$

$$b = \sqrt[4]{\frac{11}{3}}$$

$$b = 1.38$$

$$y = 3(1.38)^x$$

	Football	Basketball	Soccer	
Males	48	35	17	100
Females	22	38	40	100
	70	73	57	200

$$\textcircled{14} \quad \frac{40}{200} = 0.2 = 20\%$$

$$\textcircled{15} \quad \frac{73}{200} = 0.365 = 36.5\%$$

$$\textcircled{16} \quad \frac{48}{70} = 0.686 = 68.6\%$$