

**Part A: Multiple Choice**

1. c
2. c
3. b
4. a
5. c
6. d
7. c
8. d
9. b
10. b
11. d

**Part B: Full Response**

12.

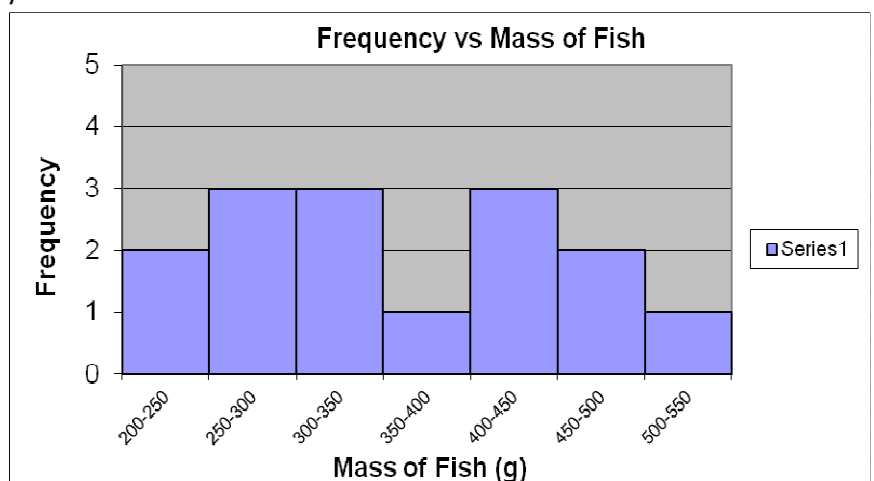
$$\begin{aligned}
 R &= y_1 - (at_1 + b) \\
 &= 5 - [-3.5(2) + 8] \\
 &= 5 - (-7 + 8) \\
 &= 4
 \end{aligned}$$

Therefore, the residual of 5 represents the vertical distance of the point (2,5) from the line of best fit. This means point (2,5) is 4 units above the line of best fit.

13. a) The graph would cause incorrect interpretations of the data because the horizontal scale (year) does not have regular intervals.
- b) The Fox News graphic showed data that did not correspond to its own scale. Putting the 8.6% unemployment rate in November 2011 higher on the chart than the March 8.8% rate, and at the same level as the 9% unemployment rate in October. Clearly, the chart was manipulated to hide the decrease in unemployment rate from October to November in 2011.

14. Rearrange data and make a frequency table.

Mass of Fish	Frequency
200-250	2
250-300	3
300-350	3
350-400	1
400-450	3
450-500	2
500-550	1



15. a) Rearrange data first.

Data	Music
70	70
76	74
77	83
78	82
80	86
84	92
88	99
97	82

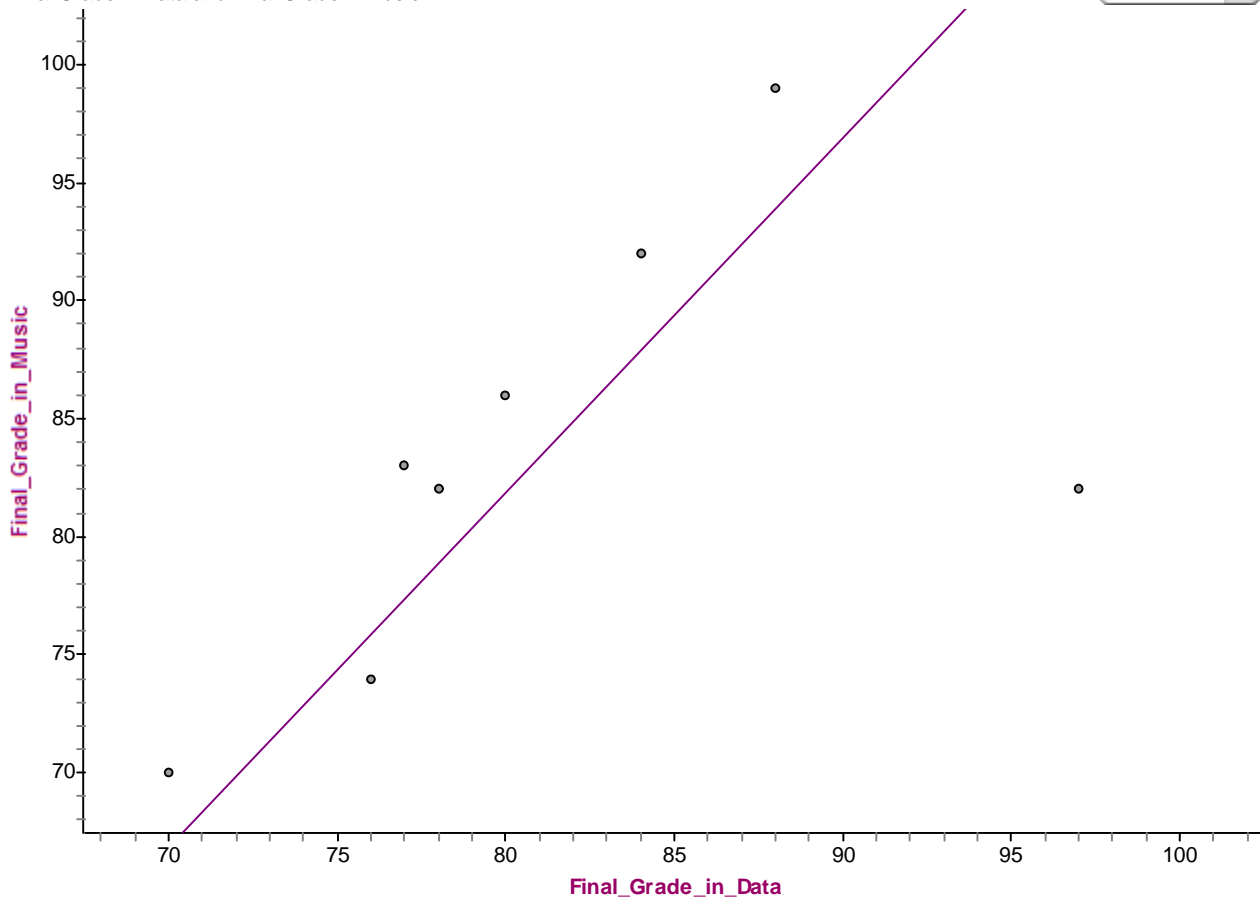
Red – Interval I  
 Blue – Interval II  
 Black – Interval III

$S_1(76,74)$   
 $S_2(79,84)$   
 $S_3(88,92)$

$$m = \frac{92 - 74}{88 - 76}$$

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

Final Grade in Data and Final Grade in Music



— Final\_Grade\_in\_Music = 1.50Final\_Grade\_in\_Data - 38.2

16. The quadratic model fits data best since the coefficient of determination,  $r^2$ , for this model is greater than the coefficient of determination for the linear model, and hence smaller residuals. The linear model seems to be the best model for the starting/initial state, whereas the quadratic model seems to be the best model for the final state.

**Part C: Data Analysis Using Technology**

17. a) Velocity = 0.42 Temperature + 333.2 and

the correlation coefficient,

$$r = \sqrt{0.8909} = 0.944$$

b) Temperature = -3, so

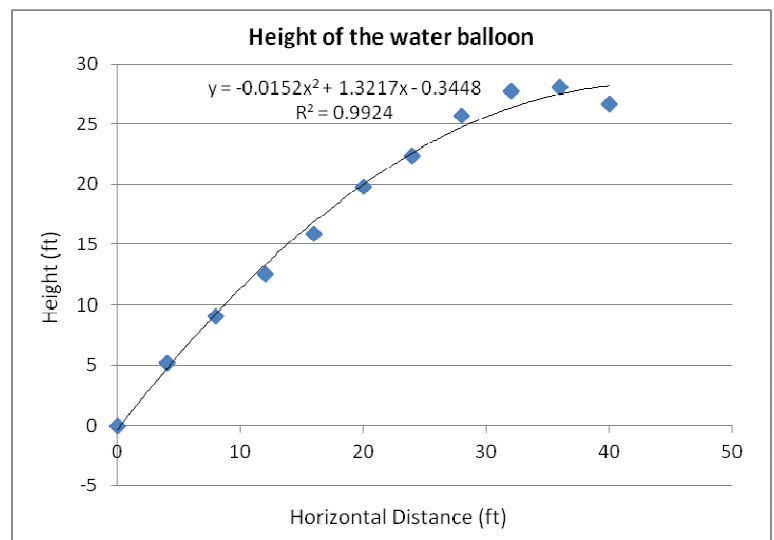
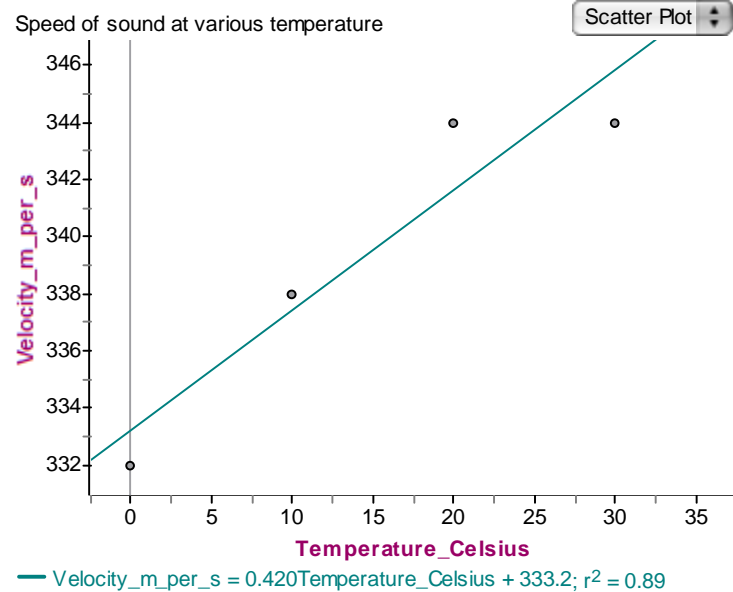
$$\text{Velocity} = 0.42(-3) + 333.2 = 331.94.$$

Therefore, the speed of the sound in air that has a temperature of  $-3^{\circ}\text{C}$  is 331.94 m/s.

c) Density of the medium, humidity of the air (properties of the air).

18. a)  $y = -0.0152x^2 + 1.3217x - 0.3448$

Horizontal Distance (ft)	Height (ft)
0	0
4	5.2
8	9.1
12	12.6
16	15.9
20	19.8
24	22.4
28	25.7
32	27.7
36	28.1
40	26.7



b)  $x=60$ ,  $x$  represents the horizontal distance and  $y$  represents the height.

$$\begin{aligned} x &= -0.0152(60^2) + 1.3217(60) - 0.3448 \\ &= -0.0152(3600) + 79.302 - 0.3448 \\ &= -54.72 + 79.302 - 0.3448 \\ &= 24.24 \end{aligned}$$

Therefore, the height of the target if the water balloon hits it a horizontal distance of 60 ft is approximately 24.24 ft.

c) Very confident (99.28%) since the coefficient of determination is 0.9928, very close to 1. This means that 99.28% of the change in height is due to the change in the horizontal distance.