

## Mth 96 Chapter 1 Review

- Justify and show the means by which you arrive at your answers for full credit.
- Place a **box** around your final answer.
- Answers must be labeled for full credit.

X

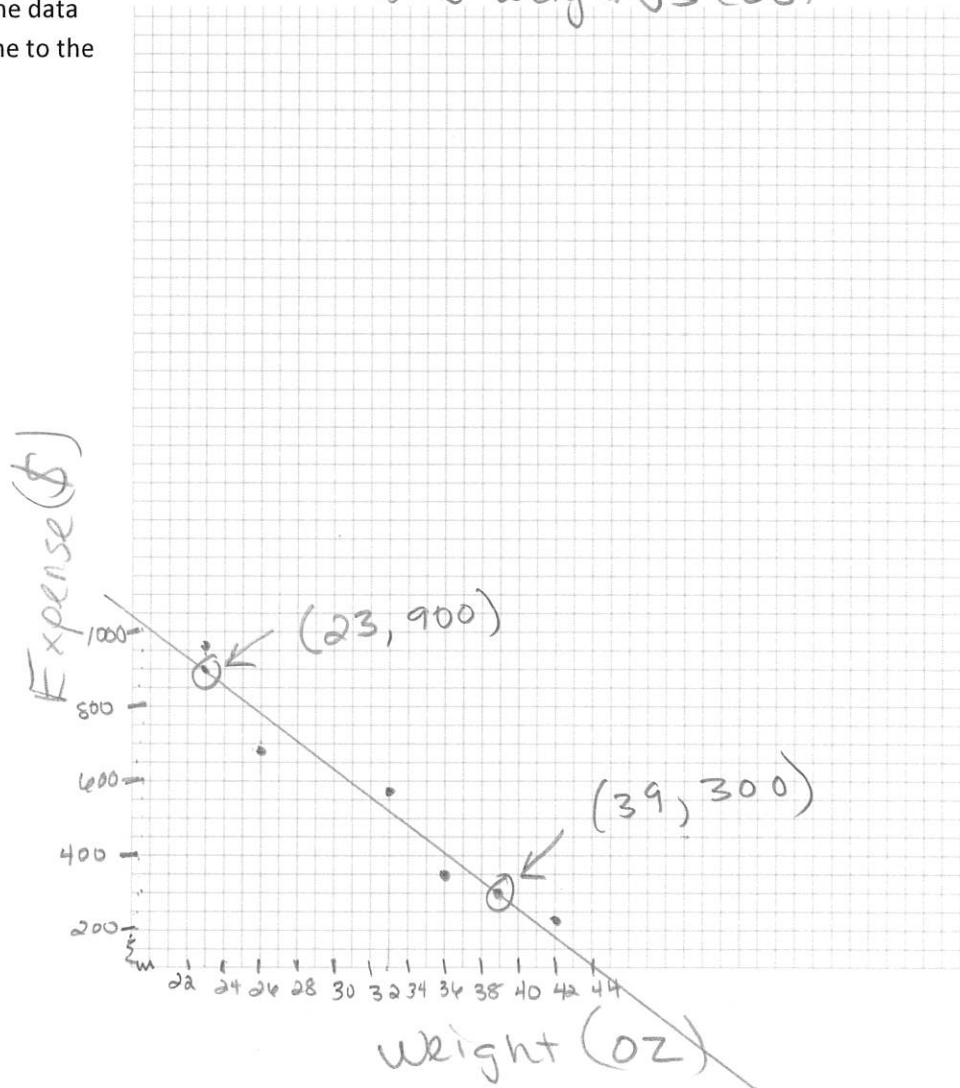
Weight (oz.)	Expense (\$)
42	\$240
36	\$350
33	\$580
26	\$740
23	\$960

1. In the world of bicycles, a light bike is an expensive bike. Consider the data for the weight of bike frames as function of their price:

- a. Make a graph of the data and add a trend line to the graph

Bike weight vs cost

23 - 42  
240 - 960



- b. Find the slope between the 23 and 42 ounce frames and explain its meaning in context in a complete sentence.  $(23, 960)$   $(42, 240)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{240 - 960}{42 - 23} = \frac{-720}{19} \approx -37.89$$

For every 1 oz of weight the cost drops by \$37.89

- c. Choose 2 representative points from your trend line and find its equation.

$$m = \frac{300 - 960}{39 - 23} = \frac{-660}{16} \approx -37.5$$

$$y = -37.5x + 1762.5$$

$$\begin{aligned} 300 &= -37.5(39) + b \\ 300 &= -1462.5 + b \\ +1462.5 & \quad +1462.5 \\ \hline 1762.5 &= b \end{aligned}$$

d. Use regression to find an equation for the trend line (round decimals to 2 places).

$$a = -37.17948718$$

$$b = 1763.74359$$

$$y = -37.18x + 1763.74$$

e. Use your regression equation to predict how light of a frame you might get if you spent \$1200.

$$y = 1200$$

$$1200 = -37.18x + 1763.74$$

$$\frac{-563.74}{-37.18} = \frac{-37.18x}{-37.18}$$

$$x = 15.14245293$$

$$\approx 15.2 \text{ oz}$$

f. Use your regression equation to predict how much you would have to spend to buy a 30 ounce frame.

$$x = 30$$

$$y = -37.18(30) + 1763.74$$

$$= -1115.4 + 1763.74$$

$$y = \$648.34$$

2. Storage tanks and their respective prices are listed in the table.

a. Find the equation of the line passing through (8,25) and (28,165).

$$m = \frac{165 - 25}{28 - 8} = \frac{140}{20} = 7$$

$$25 = 7(8) + b$$

$$25 = 56 + b$$

$$-56 \quad -56$$

$$-31 = b$$

$$y = 7x - 31$$

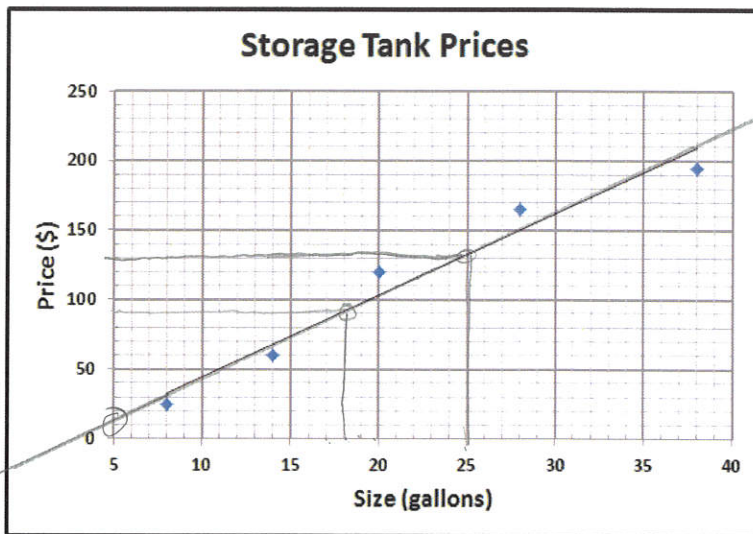
Size (gal)	Price
8	\$25.00
14	\$60.00
20	\$120.00
28	\$165.00
38	\$195.00

b. Use the graph and the trend line to estimate the cost of an 18 gallon tank.

$$\approx \$90$$

c. Use the graph and the trend line to estimate the size of a \$130 tank.

$$\approx 25 \text{ gallons}$$



d. Choose 2 representative points from the trend line and find its equation.

$$(18, 90) \quad (25, 130)$$

$$m = \frac{130 - 90}{25 - 18} = \frac{40}{7} \approx 5.714285714$$

$$90 = 5.71(18) + b$$

$$90 = 102.78 + b$$

$$-102.78 \quad -102.78$$

$$-12.78 = b$$

$$y = 5.71x - 12.78$$

e. Use regression to find an equation for the trend line (round decimals to 2 places).

$$a = 5.882564841$$
$$b = -14.06340058$$

$$y = 5.88x - 14.06$$

~~$$y = 5.88x + -14.06$$~~

f. Explain the meaning of the slope in context of the data.

For every 1 gallon increase the price goes up by \$5.88

g. Explain the meaning of the y-intercept in context of the data.

$(0, -14.06)$  zero gallon tank cost -14.06

h. Use your regression equation to estimate the price of a 45 gallon tank.

$$x = 45$$

$$y = 5.88(45) - 14.06$$
$$= 264.6 - 14.06$$

$$y = 250.54$$

\$250.54

i. Use your regression equation to predict the size of a tank that costs \$350.

$$y = 350$$

$$350 = 5.88x - 14.06$$
$$+14.06 \qquad \qquad \qquad +14.06$$

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$$\frac{364.06}{5.88} = \frac{5.88x}{5.88}$$

$$x = 61.91496599$$

$x \approx 62$  gallons