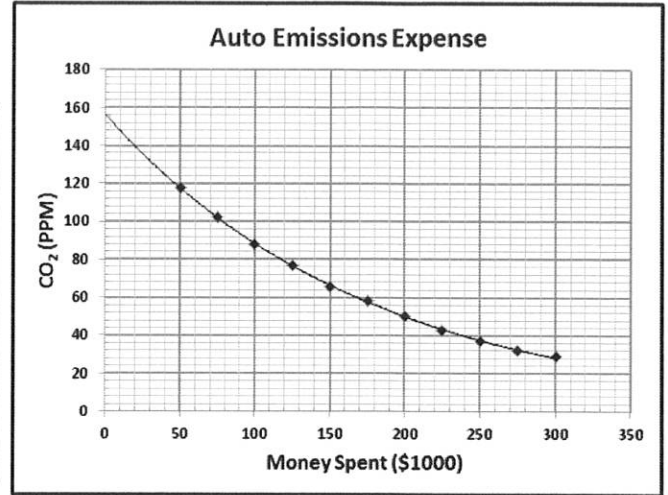


Mth 96 Chapter 4 Review

- 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.

1. Consider the data and graph for the amount of money a car company could spend in thousands of dollars to reduce carbon dioxide (CO₂) in their vehicles. *Note: PPM is parts per million.*

Money Spent (\$1000)	CO ₂ (PPM)
50	118
75	102
100	88
125	77
150	66
175	58
200	50
225	43
250	37
275	32
300	29



- a. Find the slope between \$50,000 and \$75,000 and explain its meaning in context in a complete sentence.

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad (50, 118) \quad (75, 102)$$

$$m = \frac{102 - 118}{75 - 50} = \frac{-16}{25} \approx -0.64$$

For every \$1000 the CO₂ goes down by 0.64 ppm.

- b. Find the slope between \$250,000 and \$300,000 and explain its meaning in context in a complete sentence.

$$(250, 37) \quad (300, 29)$$

$$m = \frac{29 - 37}{300 - 250} = \frac{-8}{50} \approx -0.16$$

For every \$1000 the CO₂ goes down by 0.16 ppm.

- c. Give the coordinate for the **y-intercept** from the graph and explain its meaning in context.

≈ 156 CO₂ ppm

If they don't spend any money (\$0) their CO₂ output is 156 ppm.

Exp Reg $y = ab^x$

- d. Use regression to find an **exponential** equation to model the data. Round the numbers in your equation to 3 decimal places.

$$a = 156.324357$$

$$b = 0.9943086246$$

$$y = 156.324 \cdot 0.994^x$$

- e. State the **growth rate** and explain its meaning in context in a complete sentence.

b -value 0.994 $1 - 0.994 = 0.006 \approx 0.6\%$

The CO_2 is going down by about 0.6% for every \$1000.

- f. Use your equation to estimate the CO_2 emission the company could expect if they spend \$350,000.

Find y when $x = 350$

$$y = 156.324 \cdot 0.994^{350}$$

$$y = 19.02217612$$

they could expect a CO_2 emission of 19.02 ppm if they spent \$350,000

- g. Use your equation to estimate the amount the company would have to spend to reduce emissions to 18 PPM. Find x when $y = 18$

$$18 = \frac{156.324 \cdot 0.994^x}{156.324}$$

$$\log 0.1151454671 = \log 0.994^x$$

$$\frac{\log 0.1151454671}{\log 0.994} = \frac{x \cdot \log 0.994}{\log 0.994}$$

$$359.1779729 = x$$

They need to spend about \$359,178 to reduce emission to 18 ppm

Remember

Simplify

$$(4x^2 y^{-1} z^3)^4 = 4^4 x^{2 \cdot 4} y^{-1 \cdot 4} z^{3 \cdot 4}$$

$$= 256 x^8 y^{-4} z^{12}$$

$$= \frac{256 x^8 z^{12}}{y^4}$$

Simplify

$$\frac{8x^3 y^4 z^2}{2x y^5 z^{-4}} = 4x^{3-1} y^{4-5} z^{2-(-4)}$$

$$= 4x^2 y^{-1} z^6$$

$$= \frac{4x^2 z^6}{y}$$

Solve and Round to the nearest ten thousandth

$$5 \cdot 2^{x-3} + 4 = 12$$

$$5 \cdot 2^{x-3} = 8$$

$$\log 2^{x-3} = \log 1.6$$

$$\frac{(x-3) \log 2 = \log 1.6}{\log 2}$$

$$x-3 = 0.6780719051$$

$$x = 3.6780719051$$

$$x = 3.67811$$