

The national speed limit in 1980 was 55 mph. There were an average of 15 accidents per 1000 miles driven.

In 1987, the speed limit was raised to 70 mph. There were an average of 20 accidents per 1000 miles. Assume a linear relationship between speed limit and accidents.

1. Write an equation showing # of accidents as a function of speed limit.
Check your work.
2. Graph the resulting line.
3. Predict the # of accidents with a 45 mph limit

$$1. \begin{matrix} (55, 15) & (70, 20) \\ \nearrow \begin{matrix} x_1 & y_1 \end{matrix} & \begin{matrix} x_2 & y_2 \end{matrix} \end{matrix}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{20 - 15}{70 - 55} = \frac{5}{15} = \frac{1}{3}$$

$$y = \frac{1}{3}x + b$$

$$15 = \frac{1}{3}(55) + b$$

$$15 = \frac{55}{3} + b$$

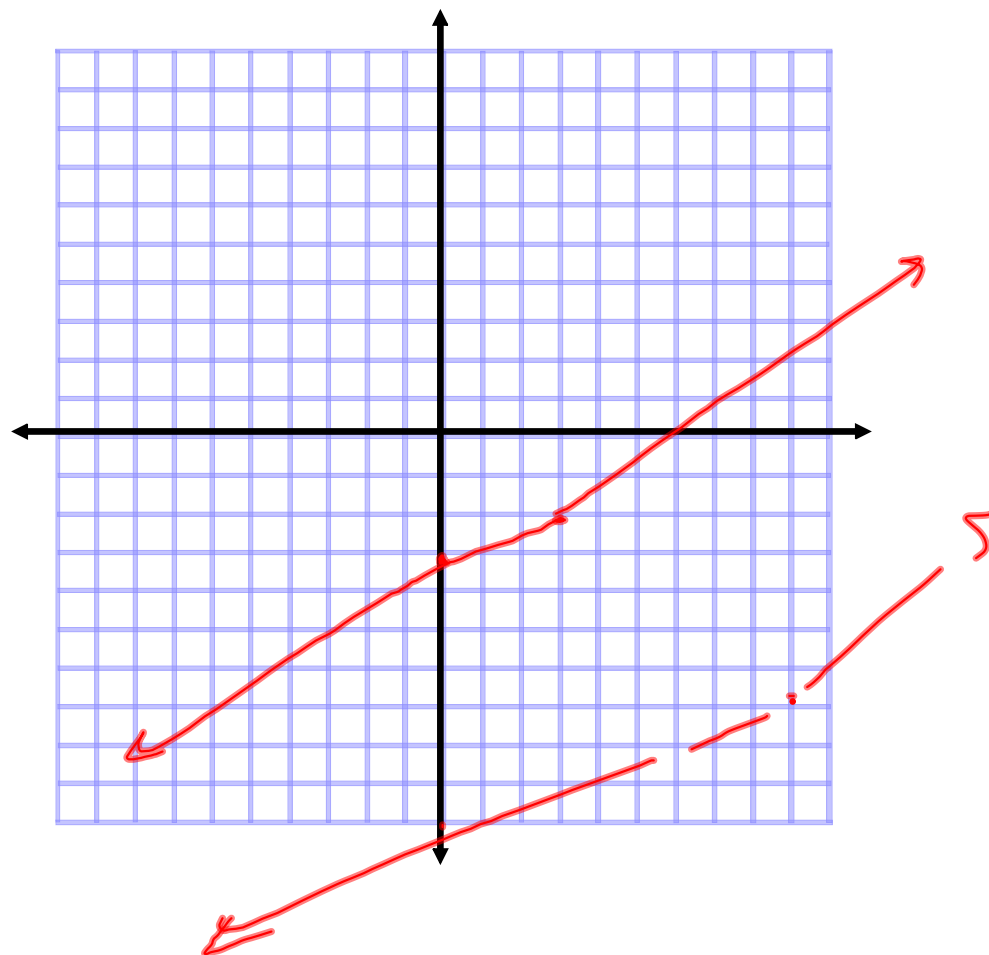
$$\frac{45}{3} - \frac{55}{3} = b = -\frac{10}{3}$$

$$y = \frac{1}{3}x - \frac{10}{3}$$

$$20 = \frac{1}{3}(70) - \frac{10}{3}$$

$$\checkmark 20 = \frac{70}{3} - \frac{10}{3} = \frac{60}{3} = 20 \checkmark$$

②



$$3. \quad y = \frac{1}{3}x - \frac{10}{3}$$

$$= \frac{1}{3}(45) - \frac{10}{3}$$

$$= \frac{45}{3} - \frac{10}{3} = \frac{35}{3} \approx \textcircled{12}$$

Homework: p. 275 4-12, 18
p. 349 1-6, 12-14, 17