Lesson 7.3: Slope-Point Form of a Linear Equation

Practice – III

1. Convert the equation $y-5=-\frac{3}{8}(x-12)$ into

   a. slope-intercept form

$$y-5=-\frac{3}{8}(x-12)$$
$$y-5=-\frac{3}{8}x+\frac{9}{2}$$
$$y=-\frac{3}{8}x+\frac{19}{2}$$

   b. general form

$$y-5=-\frac{3}{8}(x-12)$$
$$y-5=-\frac{3}{8}x+\frac{9}{2}$$
$$\frac{3}{8}x+y-\frac{19}{2}=0$$
$$8\left(\frac{3}{8}x+y-\frac{19}{2}\right)=8(0)$$
$$3x+8y-76=0$$

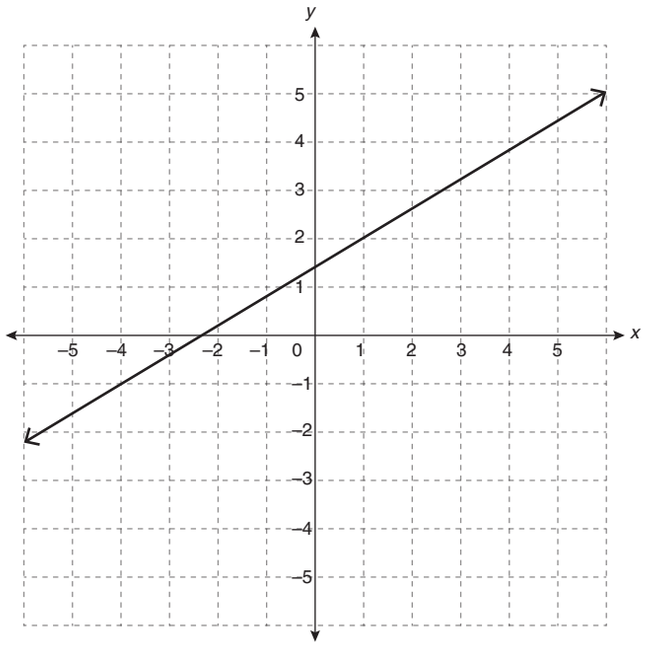
2. A line passes through the points $(-5,-5)$ and $(19,-3)$. Determine the equation of this line, in slope-point form.

$$m=\frac{y_2-y_1}{x_2-x_1}$$
$$=\frac{-3-(-5)}{19-(-5)}$$
$$=\frac{2}{24}$$
$$=\frac{1}{12}$$

Use one of the points to write the equation in slope-point form.

$$y-y_1=m(x-x_1)$$
$$y-(-5)=\frac{1}{12}(x-(-5))$$
$$y+5=\frac{1}{12}(x+5)$$

3. State two different equations in slope-point form that represent the graph of the relation shown.



The slope of the line is $\frac{3}{5}$, and the points (–4, –1) and (1, 2) are both on the line.

$$y - y_1 = m(x - x_1) \qquad y - y_1 = m(x - x_1)$$
$$y - (-1) = \frac{3}{5}(x - (-4)) \qquad y - 2 = \frac{3}{5}(x - 1)$$
$$y + 1 = \frac{3}{5}(x + 4)$$

Two possible equations are $y + 1 = \frac{3}{5}(x + 4)$ and $y - 2 = \frac{3}{5}(x - 1)$.

4. The graph of a linear relation has a slope of 16.5 and an x-intercept of 121. Determine the y-intercept.

The x-intercept corresponds to the point (121,0) .

$$y - y_1 = m(x - x_1)$$
$$y - 0 = 16.5(x - 121)$$
$$y = 16.5x - 1\,996.5$$

Despite starting with the slope-point form, the equation simplified to slope-intercept form, making the y-intercept easy to identify.

The y-intercept is –1 996.5.

5. While planning a trip to Europe, Brian and Donna exchanged some Canadian dollars for euros. Brian bought €300 for $430 and Donna bought €450 for $640 from a merchant who uses a linear relation to calculate the rate.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   a. Let x represent the euros purchased and let y represent the cost, in Canadian dollars. Determine the slope of the graph of the relation.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{640 - 430}{450 - 300} \\ &= \frac{210}{150} \\ &= 1.4 \end{aligned}$$

   b. What does the slope represent in this scenario?

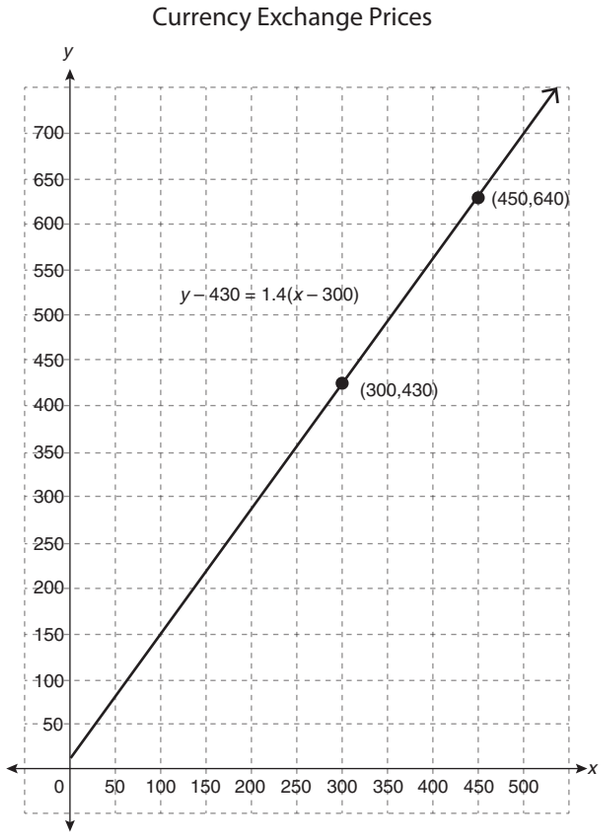
The slope represents the number of Canadian dollars required to buy one euro. Including units, the slope can be written as 1.4 CAD/EUR.

   c. Write a currency exchange equation in slope-point form.

Equations will vary depending on the point used. The equation shown uses the point (300,430).

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - 430 &= 1.4(x - 300) \end{aligned}$$

d. Graph the relation represented by the currency exchange equation.



e. The merchant charges a service fee for each exchange. What characteristic of the graph represents the service fee? What is the service fee?

The y-intercept represents the service fee, in Canadian dollars.

$$y - 430 = 1.4(x - 300)$$
$$y - 430 = 1.4(0 - 300)$$
$$y - 430 = -420$$
$$y = 10$$

The service fee is \$10.

Please complete *Lesson 7.3 Explore Your Understanding Assignment* located in *Workbook 7.3* before proceeding to *Lesson 7.4*.