

Opening Warmup Question...

7. University students In 1971, there were 323 000 full-time university students in Canada. In 1997, there were 544 000. Find the average rate of change, to the nearest hundred students per year.

(1971, 323000)

(1997, 544000)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{544000 - 323000}{1997 - 1971} = \frac{221000}{26}$$

= 8500 students per year

pg 408 8.2 Slope as a Rate of Change

12. a) Rate of change as $\frac{\text{metre}}{\text{second}}$

(2.8, 960) (4.9, 1680)

$$m = \frac{1680 - 960}{4.9 - 2.8} = \frac{720}{2.1} = 342.85... \\ = 343 \text{ m/s}$$

b) The storm is moving 343 metres every second.

c) At 3.7 seconds, what is the distance?

$$d = 3.7(343)$$

$$d = 1269 \text{ metres}$$



d) 2500m from storm, what is the time interval?

$$t = \frac{2500}{343} = 7.3 \text{ seconds}$$

15. In 1961, May 3rd $\Rightarrow (1961, 123)$

In 1998, June 27th $\Rightarrow (1998, 178)$

a) Rate of change as $\frac{\text{day}}{\text{year}}$

$$m = \frac{178 - 123}{1998 - 1961} = \frac{55}{37} = 1.5 \text{ days/year.}$$

8.3 | Point-Slope Form.

① Standard Form Equation.

ex: $3x - 8y + 4 = 0$

Generic Form: $Ax + By + C = 0$

where A, B, C and integers and A is positive
no fractions
no decimals

② Point-Slope Form

$$y - y_1 = m(x - x_1)$$

can be created given a
slope (m) and point (x_1, y_1)

$$\frac{y_2 - y_1}{x_2 - x_1} = m(x_2 - x_1)$$

Write the point-slope form equation:

1. $(1, 2)$ $m = 5$

$$y - y_1 = m(x - x_1)$$

$$y - 2 = 5(x - 1)$$

$$y - 2 = 5x - 5$$

3. $(-4, 1)$ $m = 1$

$$y - y_1 = m(x - x_1)$$

$$y - 1 = 1(x - (-4))$$

$$y - 1 = x + 4$$

5. $(-3, -2)$ $m = -3$

$$y - y_1 = m(x - x_1)$$

$$y - (-2) = -3(x - (-3))$$

$$y + 2 = -3x - 9 \quad \leftarrow \text{Point-slope Form}$$

$$3x + y + 11 = 0 \quad \leftarrow \text{Convert to Standard Form.}$$

8. $(-6, 8)$ $m = -\frac{3}{4}$

$$y - y_1 = m(x - x_1)$$

$$y - 8 = -\frac{3}{4}(x - (-6))$$

$$4(y - 8) = -\frac{3}{4}x - \frac{18}{4} \quad \leftarrow \text{point slope form.}$$

$$4y - 32 = -3x - 18$$

Convert to standard form

① get rid of fractions

② move.

$$3x + 4y - 14 = 0$$

Hw: pg 407 # 13, 14, 16

418 # 2, 4, 6, 7