you can only sole equations

Review

13. Rewrite each expression by eliminating parentheses and then combining like terms.

a. $2 + 3(x - 4)$ **b.** $(11 - 3x) - 2(4x + 5)$ **c.** $5.1 - 2.7[1 - (2x + 9.7)]$

14. Solve each equation.

a. $12 = 6 + 2(x - 1)$ **b.** $27 = 12 - 2(x + 2)$

15. Charlotte and Emily measured the pulse rates of everyone in their class in beats per minute and collected this set of data.

{62, 68, 68, 70, 74, 66, 82, 74, 76, 72, 70, 68, 80,
60, 84, 72, 66, 78, 70, 68, 66, 82, 76, 66, 66, 80}

a. What is the mean pulse rate for the class?

b. What is the standard deviation? What does this tell you?

a. Solve $y = 4.7 + 3.2x$ for y if $x = 5$. (a)

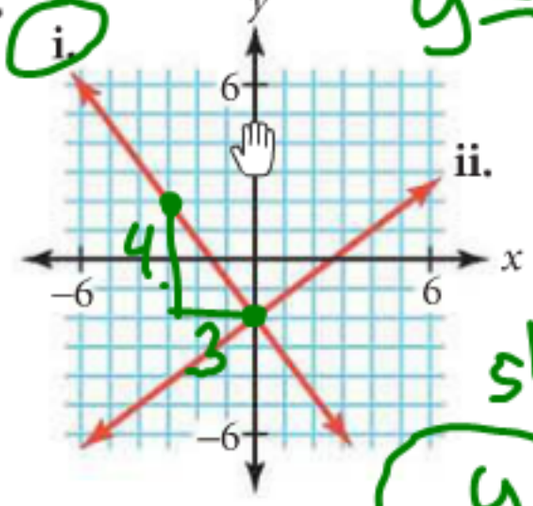
b. Solve $y = -2.5 + 1.6x$ for x if $y = 8$.

c. Solve $y = a - 0.2x$ for a if $x = 1000$ and $y = -224$.

d. Solve $y = 250 + bx$ for b if $x = 960$ and $y = 10$.

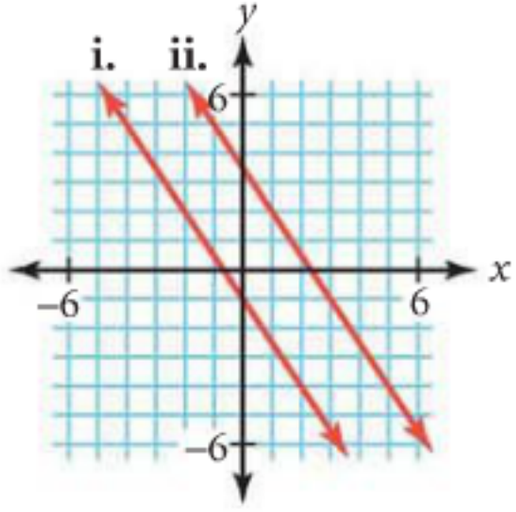
4. Find the equations of both lines in each graph.

a. i.



$y = a + bx$
$\uparrow$ $\uparrow$ slope
y-int
y-int $(0, -2)$
slope $= \frac{-4}{3} = b$ $a = -2$
$y = -2 - \frac{4}{3}x$

b.



c. What do the equations in 4a have in common? What do you notice about their graphs? (a)

d. What do the equations in 4b have in common? What do you notice about their graphs?

Point-Slope form

example

$(3, -2050)$

$(7, 1550)$

write the equation

$$\text{slope} = \frac{1550 - -2050}{7 - 3}$$

$$= 900$$

x	y	
0	-4150	-900
1		-900
2		-900
3	-2050	-900
4		-900
5		-900
6		-900
7	1550	

$-2050 - 900(3)$

$1550 - 900(7)$

$y = -2050 + 900(x - 3)$

$y = -2050 + 900x - 2700$

point-slope form

but, example

$(2003, 87)$

$(2009, 413)$

write the equation of the line

$$\text{slope} = \frac{413 - 87}{2009 - 2003} = \frac{326}{6}$$

$$= 54.\overline{3}$$

$87 - 54.\overline{3}(2003) + 54.\overline{3}x$

y_0

$y = 87 + 54.\overline{3}(x - 2003)$

point $(2003, 87)$

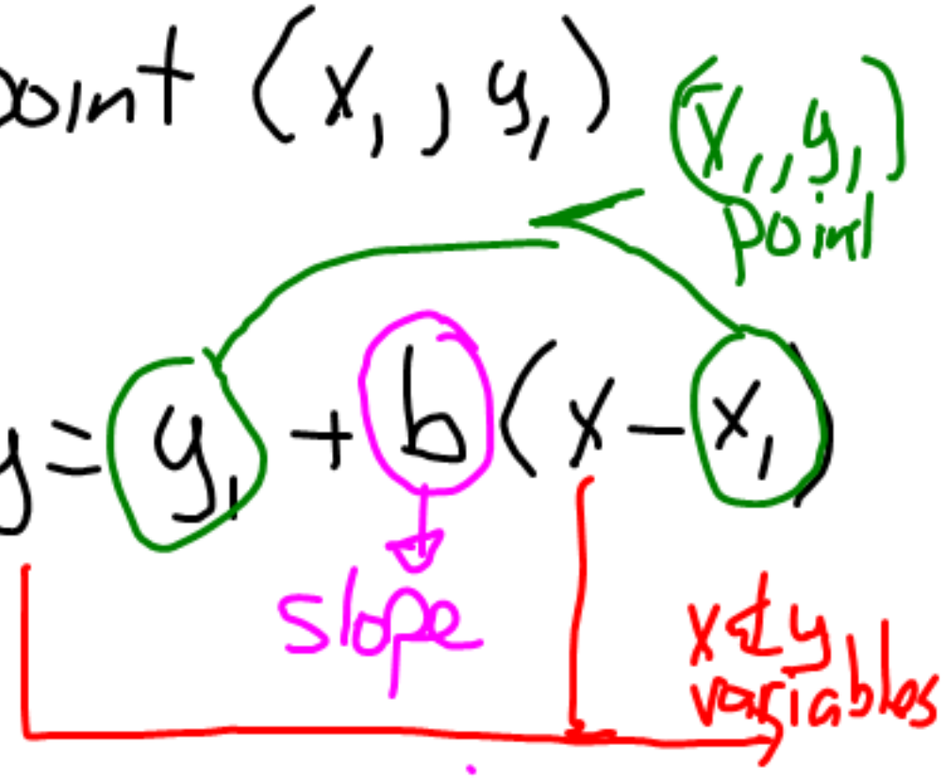
slope $54.\overline{3}$

Define Point-Slope form

give a line through point (x_1, y_1)

with a slope of b

the equation is $y = y_1 + b(x - x_1)$



point $(-5, 17)$

slope $= \frac{3}{4}$

$y = 17 + \frac{3}{4}(x - (-5))$

$y = 17 + \frac{3}{4}(x + 5)$

write the equation of the line through

(20,5) & (50, 85) slope $= \frac{8}{3} \approx 1.67$

$y = 5 + \frac{8}{3}(x-20)$

$y = 85 + \frac{8}{3}(x-50)$

Write the equation through the points

(20, 50) & (40, 175)

(20, 50) point

$$\text{slope} = \frac{175-50}{40-20} = \frac{125}{20} = \frac{25}{4} = 6.25$$

slope

$y = y_1 + b(x - x_1)$

$y = 50 + 6.25(x - 20)$

or

$y = 175 + 6.25(x - 40)$

Point-Slope form

example 1

$y = -4750 + 900x$

⇒ (3, -2050)
(7, 1530)

write the equation of the line

need slope = 900
y-int (0, -4750)

$\text{slope} = \frac{1550 - -2050}{7 - 3} = \frac{3600}{4} = 900$

n	a_n	
0	-4750	+900
1	-3850	+900
2	-2950	+900
⇒ 3	-2050	+900
4	-1150	

$-2050 + 900(3) + 900x$

$y = -2050 + 900(x - 3)$

Point-slope ↗

example 2

(2003, 1100)
(2009, 2654)

write the equation

need slope
y-int

$\text{slope} = \frac{2654 - 1100}{2009 - 2003} = \frac{1554}{6} = 259$

$y = 1100 + 259(-2003) + 259x$

$y = \underbrace{1100}_{\text{point}} + \underbrace{259}_{\text{slope}}(x - 2003)$

↑ Equation

Section 3.3 Fit a line to Data

- Define line of Fit

last week
- graph Scatterplot
- Draw line
- write equations

- Point-Slope form of a line
- Extrapolation & Interpolation

use a line of fit

Point-slope form

example 1 $y = -4750 + 900x$

Write the equation of the line through $(3, -2050)$ $(?, 1550)$

need slope $= 900$

y-int $(0, -4750)$

$$\text{slope} = \frac{1550 - -2050}{7 - 3} = \frac{3600}{4} = 900$$

n	u_n	
0	-4750	+900
1	-3850	+900
2	-2950	+900
⇒ 3	-2050	+900
4	-1150	+900
5	-250	+900
6	650	+900
⇒ 7	1550	+900

$u_n = u_{n-1} + 900$

$y = -2050 - 3(900) + 900x$

y-int (3, -2050) point

$y = -2050 + 900(x - 3)$

900 = slope

point-slope form

Example 2

(1975, 14) ✓

(2015, 134) ✓

$$\text{slope} = \frac{134 - 14}{2015 - 1975} = \frac{120}{40} = 3$$

$y = 14 + 3(x - 1975)$

check if $x = 1975$

$y = 14 + 3(1975 - 1975)$

$y = 14$

if $x = 2015$

$y = 14 + 3(2015 - 1975)$

$y = 134$

Practice Your Skills

Slope = rise of / run of = $\frac{y_1 - y_2}{x_1 - x_2}$

A graphing calculator for Exercises 7, 10–12, and 15.

1. Find the slope of the line containing each pair of points.

a. (3, −4) and (7, 2) @ **b.** (5, 3) and (2, 5) **c.** (−0.02, 3.2) and (0.08, −2.3)

$\frac{3.2 - -2.3}{-0.02 - 0.08} = \frac{5.5}{-0.1} =$

2. Find the slope of each line.

a. $y = 3x - 2$ **b.** $y = 4.2 - 2.8x$ **c.** $y = 5(3x - 3) + 2$ @

d. $y - 2.4x = 5$ **e.** $4.7x + 3.2y = 12.9$ **f.** $\frac{2}{3}y = \frac{2}{3}x + \frac{1}{2}$

3. Solve each equation.

a. Solve $y = 4.7 + 3.2x$ for y if $x = 3$. @

b. Solve $y = -2.5 + 1.6x$ for x if $y = 8$.

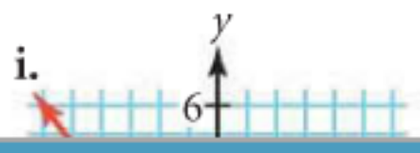
c. Solve $y = a - 0.2x$ for a if $x = 1000$ and $y = -224$.

d. Solve $y = 250 + bx$ for b if $x = 960$ and $y = 10$.

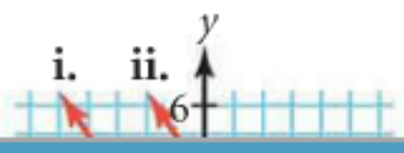
$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-2.3 - 3.2}{0.08 - -0.02} = \frac{-5.5}{0.1} =$

4. Find the equations of both lines in each graph.

a.



b.

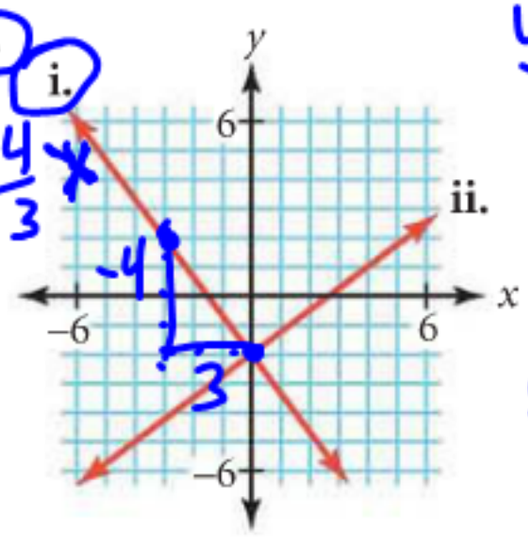


c. Solve $y = a - 0.2x$ for a if $x = 1000$ and $y = -224$.

d. Solve $y = 250 + bx$ for b if $x = 960$ and $y = 10$.

4. Find the equations of both lines in each graph.

a.



$y = -2 - \frac{4}{3}x$

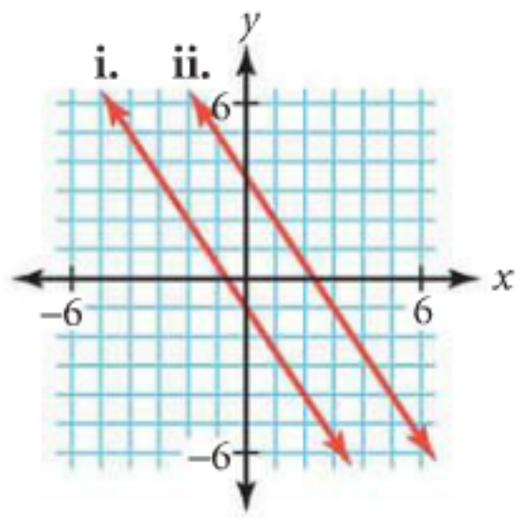
$y = a + bx$

y-int slope

y-int = (0, −2)

slope = $-\frac{4}{3}$

b.



c. What do the equations in 4a have in common? What do you notice about their graphs? (a)

d. What do the equations in 4b have in common? What do you notice about their graphs?

5. The equation of line m is $y = -4 + 2.5x$. Line l is parallel to line m. Line n is perpendicular to line m. What are the slopes of lines l and n? (h)