

Show all reasonable work clearly, neatly, systematically, and understandably. Use a ruler or a straight-edge to graph the line. The accuracy and neatness is part of the grading. Total points: 102

1. (5) 650 is what percent of 200? Write the equation then solve.

$$\rightarrow 650 = x \cdot 200$$

$$\frac{650}{200} = x$$

$$3.25 = x$$

$$3.25 \times 100\% = x$$

$$\underline{\underline{325\% = x}}$$

2. (7) The perimeter of a rectangular garden is 60 feet. The width of the garden is 9 feet less than twice the length. Find the length and width of the garden. Do in 4-step method

1) let x be the length of the rectangular garden
(therefore, the width is $2x - 9$)

2) $P = 2 \text{ length} + 2 \text{ width}$

3) $60 = 2x + 2(2x - 9)$

$$60 = 2x + 4x - 18$$

$$60 = 6x - 18$$

$$78 = 6x$$

$$\frac{78}{6} = x$$

$$13 = x$$

4) So, the length is 13 ft
and the width is $2(13) - 9 = 17$ ft.

3. (7) The supplement of an angle is four times the complement of that angle. Find the measure of that angle.
Do in 4-step method

1) let x be the measure of the angle.
(therefore, $90^\circ - x$ is the measure of the complement
and $180^\circ - x$ is the measure of the supplement)

2) $180^\circ - x = 4(90^\circ - x)$

3) $180^\circ - x = 360^\circ - 4x$

$$-x + 4x = 360^\circ - 180^\circ$$

$$3x = 180^\circ$$

$$x = \frac{180^\circ}{3}$$

$$x = 60^\circ$$

4) So, the measure of the angle is 60°

4. (9) Office max recently advertised a three-subject notebook for \$2.49 and a five-subject notebook for \$3.79. At the start of a recent semester, a combination of 50 of these notebooks was sold for a total of \$166.10. How many of each type were sold? Do in 4-step method

1) Let x be the number of 5-subject notebooks sold.

2)

Type	Number	Unit Price	Total Price
5-subject	x	3.79	$3.79x$
3-subject	$50-x$	2.49	$2.49(50-x)$
	50		$166.10 = 3.79x + 2.49(50-x)$

3)

$$166.10 = 3.79x + 2.49(50-x)$$

$$166.10 = 3.79x + 124.50 - 2.49x$$

$$166.10 = 1.3x + 124.50$$

$$166.10 - 124.50 = 1.3x$$

$$41.60 = 1.3x$$

$$\frac{41.6}{1.3} = x$$

$$\frac{416}{13} = x$$

$$32 = x$$

4) So, the number of 5-subject notebooks sold is 32, and 3-subject ones is 18.

5. (10) Daniel invests a total of \$10,000 in two different plans. Plan A returns 9% annually and Plan B returns 7% annually. If the total annual interest is \$850, find the amount invested in each plan. Do in 4-step method..

1) Let x be the amount invested in Plan A

2)

Plan	Investment	Rate of Interest	Total Interest
A	x	0.09	$0.09x$
B	$10,000-x$	0.07	$0.07(10,000-x)$
	10,000		$850 = 0.09x + 0.07(10,000-x)$

3)

$$850 = 0.09x + 700 - 0.07x$$

$$850 = 0.02x + 700$$

$$850 - 700 = 0.02x$$

$$150 = 0.02x$$

$$\frac{150}{0.2} = x$$

$$\frac{15000}{2} = x$$

$$7500 = x$$

4) So, the amount invested in Plan A is \$7,500 and in Plan B is \$2,500.

6. (9) Melanie wants 14 L of fruit punch that is 10% juice. She has punch that is 15% juice, and punch that is 8% juice. How many liters of each should be mixed to get 14 L of fruit punch that is 10% juice? Do in 4-step method

1) Let x be the amount of 15% juice mixed.

Type	Amount	Concentration	Total
15% juice	x	0.15	$0.15x$
8% juice	$14-x$	0.08	$0.08(14-x)$
10% mix	14	0.10	$1.4 = 0.15x + 0.08(14-x)$

3) $1.4 = 0.15x + 1.12 - 0.08x$

$1.4 = 0.07x + 1.12$

$1.4 - 1.12 = 0.07x$

$0.28 = 0.07x$

$\frac{0.28}{0.07} = x$

$\frac{28}{7} = x$
 $4 = x$

4) So, 4L of 15% juice and 10% of 8% juice should be mixed.

7. (12.3.2.2,3.2) Let $5x - 2y = 10$. Find the following.

a. Convert the equation to slope-intercept form.

$5x - 2y = 10$

$-2y = -5x + 10$

$y = \frac{5}{2}x - 5$

d. x-intercept

$y=0 \rightarrow 5x - 2(0) = 10$

$5x = 10$

$x = 2$

x-int (2, 0)

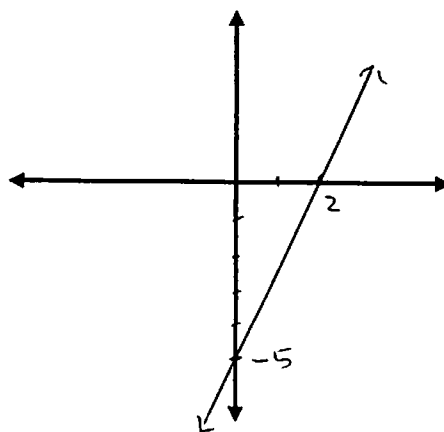
b. Slope of the line.

$m = \frac{5}{2}$

c. y-intercept

(0, -5)

e. Graph



8. (10:4,3,1,2) A line with a slope of $-\frac{3}{2}$ contains (1,2).

a. Find the equation in slope-intercept form.

$$m = -\frac{3}{2} \rightarrow y = -\frac{3}{2}x + b$$

$$(1,2) \rightarrow 2 = -\frac{3}{2}(1) + b$$

$$2 = -\frac{3}{2} + b$$

$$2 + \frac{3}{2} = b$$

$$2 + 1.5 = b \quad \text{or } b = \frac{7}{2}$$

$$3.5 = b$$

$$\text{So, } y = -\frac{3}{2}x + \frac{7}{2}$$

b. x-intercept

$$y=0 \rightarrow 0 = -\frac{3}{2}x + \frac{7}{2}$$

$$\frac{3}{2}x = \frac{7}{2}$$

$$x = \frac{7}{2} \left(\frac{2}{3}\right)$$

$$x = \frac{7}{3}$$

$$\text{So, } x\text{-int } \left(\frac{7}{3}, 0\right)$$

9. (10:2,4,1,3) A line contains (5,-4) and (-1,-2).

a. Find the slope

$$m = \frac{-2 - (-4)}{-1 - 5}$$

$$m = \frac{2}{-6}$$

$$m = -\frac{1}{3}$$

b. Find the equation. Write the equation in slope-intercept form.

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

$$(-1, -2) \rightarrow -2 = -\frac{1}{3}(-1) + b$$

$$-2 = \frac{1}{3} + b$$

$$-2 - \frac{1}{3} = b$$

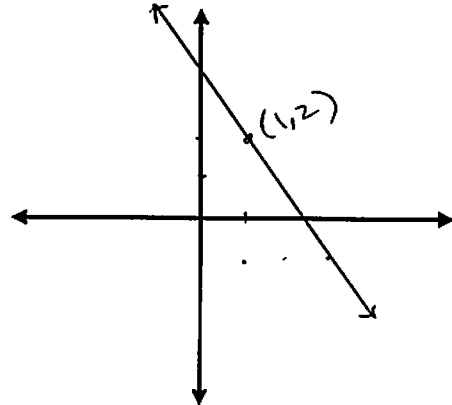
$$-2\frac{1}{3} = b$$

$$\text{So, } y = -\frac{1}{3}x - 2\frac{1}{3}$$

c. y-intercept

$$\left(0, \frac{7}{2}\right)$$

d. Graph



c. Find the y-intercept

$$\left(0, -2\frac{1}{3}\right)$$

$$\text{or } \left(0, -\frac{7}{3}\right)$$

d. Find the x-intercept

$$y=0 \rightarrow 0 = -\frac{1}{3}x - \frac{7}{3}$$

$$\frac{1}{3}x = -\frac{7}{3}$$

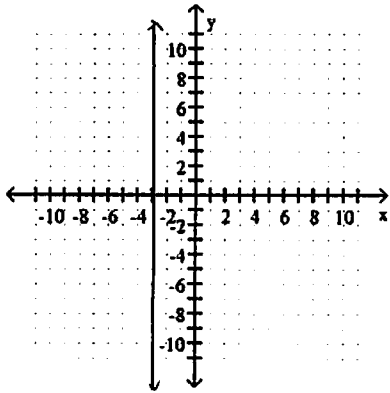
$$x = -\frac{7}{3} \left(\frac{3}{1}\right)$$

$$x = -7$$

$$\text{So, } x\text{-int } (-7, 0)$$

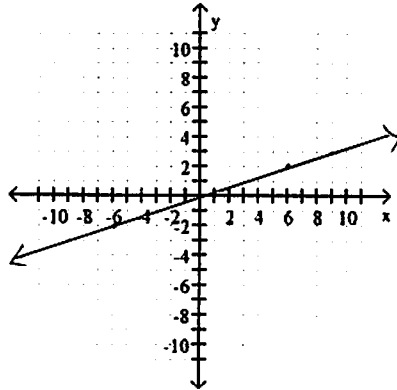
10. (7:2,3,2) Graph each line.

a. $x = -3$

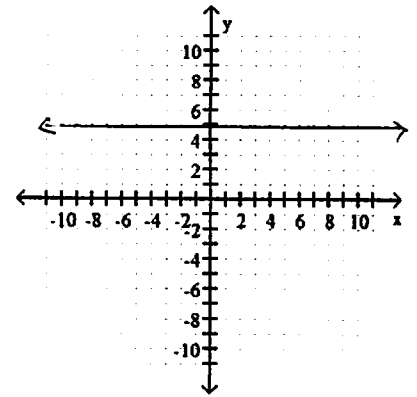


b. $x = 3y$

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



c. $y = 5$



11. (9:3,1,4,2) The equation of Line A is $4x - 3y = -15$. Line B, containing $(-3, 4)$ is parallel to Line A.

a. Write the equation of Line A in slope-intercept form.

$$4x - 3y = -15$$

$$-3y = -4x - 15$$

$$y = \frac{-4}{-3}x - \frac{15}{-3}$$

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

c. Find the equation of Line B.

Line B contains $(-3, 4)$ with $m = \frac{4}{3}$

$$m = \frac{4}{3} \rightarrow y = \frac{4}{3}x + b$$

$$(-3, 4) \rightarrow 4 = \frac{4}{3}(-3) + b$$

$$4 = -4 + b$$

$$4 + 4 = b$$

$$8 = b$$

$$\text{So, } y = \frac{4}{3}x + 8$$

b. Find the slope of Line B. Note: Two lines are parallel if they have the same slope.

$$L_B \parallel L_A \Rightarrow m_B = m_A = \frac{4}{3}$$

d. Find the y-intercept of Line B.

$$(0, 8)$$

12. (7) Find the equation of the line containing $(-1, -6)$ and $(-3, 3)$ in slope-intercept form, then write the equation in standard form.

$$m = \frac{3 - (-6)}{-3 - (-1)} = \frac{9}{-2}$$

$$y = -\frac{9}{2}x + b$$

$$(-1, -6) \rightarrow -6 = -\frac{9}{2}(-1) + b$$

$$-6 = \frac{9}{2} + b$$

$$-6 - \frac{9}{2} = b$$

$$-\frac{12}{2} - \frac{9}{2} = b$$

$$-\frac{21}{2} = b$$

$$\text{So, } y = -\frac{9}{2}x - \frac{21}{2}$$

$$\frac{9}{2}x + y = -\frac{21}{2}$$

$$\times 2$$

$$9x + 2y = -21$$