

01a. Classify each number below as a rational number or an irrational number.

	Rational	Irrational
-15π		
$\sqrt{18}$		
-8.49		
$-\sqrt{7}$		
$0.156156156\dots$		
$\frac{7}{9}$		
$\sqrt{81}$		

Irrational	1 point
Irrational	1 point
Rational	1 point
Irrational	1 point
Rational	1 point
Rational	1 point
Rational	1 point

01b. Classify each number below as a rational number or an irrational number.

	Rational	Irrational
$\sqrt{20}$		
$0.123412341234\dots$		
$\sqrt{64}$		
-3π		
$-\sqrt{5}$		
-11.25		
$\frac{5}{13}$		

Irrational	1 point
Rational	1 point
Rational	1 point
Irrational	1 point
Irrational	1 point
Rational	1 point
Rational	1 point

01c. Classify each number below as a rational number or an irrational number.

	Rational	Irrational
$-\sqrt{9}$		
0.141414...		
-12π		
$\sqrt{100}$		
-18.94		
$\frac{3}{13}$		
$\sqrt{10}$		

Rational	1 point
Rational	1 point
Irrational	1 point
Rational	1 point
Rational	1 point
Rational	1 point
Irrational	1 point

01d. Classify each number below as a rational number or an irrational number.

	Rational	Irrational
$\sqrt{10}$		
-18.94		
$\sqrt{49}$		
-13π		
0.131313...		
$\frac{3}{13}$		
$-\sqrt{9}$		

Irrational	1 point
Rational	1 point
Rational	1 point
Irrational	1 point
Rational	1 point
Rational	1 point
Rational	1 point

02a. Write the written expression using inequality notation.

y is less than -6

$y < -6$ 8 points

02b. Write the written expression using inequality notation.

y is greater than -8

$y > -8$ 8 points

- 02c. Write the written expression using inequality notation.

 y is greater than -19

$y > -19$ 8 points

- 02d. Write the written expression using inequality notation.

 y is greater than -13

$y > -13$ 8 points

- 03a. Write an algebraic expression for the following statement. Use the variable
- x
- to represent the unknown value.

19 more than two-thirds of a number

$\frac{2}{3}x + 19$ 7 points

- 03b. Write an algebraic expression for the following statement. Use the variable
- x
- to represent the unknown value.

21 more than three-fourths of a number

$\frac{3}{4}x + 21$ 7 points

- 03c. Write an algebraic expression for the following statement. Use the variable
- x
- to represent the unknown value.

19 less than two-thirds of a number

$\frac{2}{3}x - 19$ 7 points

- 03d. Write an algebraic expression for the following statement. Use the variable
- x
- to represent the unknown value.

21 less than three-fourths of a number

$\frac{3}{4}x - 21$ 7 points

- 04a. Perform the indicated operation.

$$\frac{3}{8} - \frac{2}{5}$$

$\frac{15}{40} - \frac{16}{40}$ 4 pts to here $-\frac{1}{40}$ 8 pts to here
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- 04b. Perform the indicated operation.

$$\frac{4}{9} - \frac{3}{5}$$

$\frac{20}{45} - \frac{27}{45}$ 4 pts to here $-\frac{7}{45}$ 8 pts to here
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04c. Perform the indicated operation.

$$\frac{2}{7} - \frac{3}{5}$$

$\frac{10}{35} - \frac{21}{35}$	4 pts to here
$-\frac{11}{35}$	8 pts to here

04d. Perform the indicated operation.

$$\frac{2}{5} - \frac{3}{7}$$

$\frac{14}{35} - \frac{15}{35}$	4 pts to here
$-\frac{1}{35}$	8 pts to here

05a. Simplify.

$$-5(x + 2y - 7) + 3x(2 - 5y)$$

$-5x - 10y + 35 + 6x - 15xy$	4 pts to here
$x - 10y - 15xy + 35$	8 pts to here

05b. Simplify.

$$-3(x + 2y - 7) + 5x(2 - 5y)$$

$-3x - 6y + 21 + 10x - 25xy$	4 pts to here
$7x - 6y - 25xy + 21$	8 pts to here

05c. Simplify.

$$-2(x + 5y - 7) + 4x(5 - 2y)$$

$-2x - 10y + 14 + 20x - 8xy$	4 pts to here
$18x - 10y - 8xy + 14$	8 pts to here

05d. Simplify.

$$-4(x + 5y - 7) + 2x(5 - 2y)$$

$-4x - 20y + 28 + 10x - 4xy$	4 pts to here
$6x - 20y - 4xy + 28$	8 pts to here

06a. Evaluate the given expression.

$$-(5 - 4^2)^2 - 7 \cdot (-3)$$

$-(5 - 16)^2 - 7 \cdot (-3)$	4 pts to here
$-(-11)^2 - 7 \cdot (-3)$	6 pts to here
$-121 + 21 = -100$	8 pts to here

06b. Evaluate the given expression.

$$-(6 - 4^2)^2 - 10 \cdot (-3)$$

$-(6 - 16)^2 - 10 \cdot (-3)$	4 pts to here
$-(-10)^2 - 10 \cdot (-3)$	6 pts to here
$-100 + 30 = -70$	8 pts to here

06c. Evaluate the given expression.

$$-(3 - 4^2)^2 - 6 \cdot (-3)$$

$-(3 - 16)^2 - 6 \cdot (-3)$	4 pts to here
$-(-13)^2 - 6 \cdot (-3)$	6 pts to here
$-169 + 18 = -151$	8 pts to here

06d. Evaluate the given expression.

$$-(4 - 3^2)^2 - 3 \cdot (-6)$$

$-(4 - 9)^2 - 3 \cdot (-6)$	4 pts to here
$-(-5)^2 - 3 \cdot (-6)$	6 pts to here
$-25 + 18 = -7$	8 pts to here

07a. Solve the equation.

$$1.2x - 0.8 = 0.8x + 0.4$$

$0.4x - 0.8 = 0.4$	3 pts to here
$0.4x = 1.2$	5 pts to here
$x = 3$	7 pts to here

07b. Solve the equation.

$$0.8x - 1.2 = 0.4x + 0.8$$

$0.4x - 1.2 = 0.8$	3 pts to here
$0.4x = 2.0$	5 pts to here
$x = 5$	7 pts to here

07c. Solve the equation.

$$1.3x - 0.9 = 0.9x + 0.7$$

$0.4x - 0.9 = 0.7$	3 pts to here
$0.4x = 1.6$	5 pts to here
$x = 4$	7 pts to here

07d. Solve the equation.

$$0.9x - 1.3 = 0.7x + 0.9$$

$0.2x - 1.3 = 0.9$	3 pts to here
$0.2x = 2.2$	5 pts to here
$x = 11$	7 pts to here

08a. Solve the equation.

$$14x - 18x + 10 = 18 - 20$$

$-4x + 10 = -2$	3 pts to here
$-4x = -12$	5 pts to here
$x = 3$	7 pts to here

08b. Solve the equation.

$$22x - 18x + 28 = 14 - 30$$

$-4x + 28 = -16$	3 pts to here
$-4x = -44$	5 pts to here
$x = 11$	7 pts to here

08c. Solve the equation.

$$5x - 9x + 18 = 44 - 22$$

$-4x + 18 = 22$	3 pts to here
$-4x = 4$	5 pts to here
$x = -1$	7 pts to here

08d. Solve the equation.

$$5x - 10x + 15 = 47 - 22$$

$-5x + 15 = 25$	3 pts to here
$-5x = 10$	5 pts to here
$x = -2$	7 pts to here

09a. Solve the equation.

$$6(2x - 3) + 8 = 12x - (2x + 2)$$

$12x - 18 + 8 = 12x - 2x - 2$	3 pts to here
$12x - 10 = 10x - 2$	4 pts to here
$2x - 10 = -2$	5 pts to here
$2x = 8$	6 pts to here
$x = 4$	7 pts to here

09b. Solve the equation.

$$5(2x - 3) - 2 = 5x - (2x + 3)$$

$10x - 15 - 2 = 5x - 2x - 3$	3 pts to here
$10x - 17 = 3x - 3$	4 pts to here
$7x - 17 = -3$	5 pts to here
$7x = 14$	6 pts to here
$x = 2$	7 pts to here

09c. Solve the equation.

$$4(2x - 5) + 8 = 8x - (2x + 14)$$

$$8x - 20 + 8 = 8x - 2x - 14 \quad 3 \text{ pts to here}$$

$$8x - 12 = 6x - 14 \quad 4 \text{ pts to here}$$

$$2x - 12 = -14 \quad 5 \text{ pts to here}$$

$$2x = -2 \quad 6 \text{ pts to here}$$

$$x = -1 \quad 7 \text{ pts to here}$$

09d. Solve the equation.

$$4(2x - 3) + 8 = 8x - (2x + 16)$$

$$8x - 12 + 8 = 8x - 2x - 16 \quad 3 \text{ pts to here}$$

$$8x - 4 = 6x - 16 \quad 4 \text{ pts to here}$$

$$2x - 4 = -16 \quad 5 \text{ pts to here}$$

$$2x = -12 \quad 6 \text{ pts to here}$$

$$x = -6 \quad 7 \text{ pts to here}$$

10a. The first of two numbers is six more than twice the second number. The sum of the two numbers is 24. Find each number.

Let x = the second number

and $2x + 6$ = first number 4 pts to here

$$x + 2x + 6 = 24 \quad 5 \text{ pts to here}$$

$$3x = 18 \quad 6 \text{ pts to here}$$

$$x = 6 \quad 7 \text{ pts to here}$$

The numbers are 6 and 18 8 pts to here

10b. The first of two numbers is six less than twice the second number. The sum of the two numbers is 24. Find each number.

Let x = the second number

and $2x - 6$ = first number 4 pts to here

$$x + 2x - 6 = 24 \quad 5 \text{ pts to here}$$

$$3x = 30 \quad 6 \text{ pts to here}$$

$$x = 10 \quad 7 \text{ pts to here}$$

The numbers are 10 and 14 8 pts to here

10c. The first of two numbers is eight more than three times the second number. The sum of the two numbers is 24. Find each number.

Let x = the second number

and $3x + 8$ = first number 4 pts to here

$$x + 3x + 8 = 24 \quad 5 \text{ pts to here}$$

$$4x = 16 \quad 6 \text{ pts to here}$$

$$x = 4 \quad 7 \text{ pts to here}$$

The numbers are 4 and 24 8 pts to here

- 10d. The first of two numbers is eight less than three times the second number. The sum of the two numbers is 24. Find each number.

Let x = the second number	
and $3x - 8$ = first number	4 pts to here
$x + 3x - 8 = 24$	5 pts to here
$4x = 32$	6 pts to here
$x = 8$	7 pts to here
The numbers are 8 and 16	8 pts to here

- 11a. Solve for w and be sure to simplify your answer.

$$\frac{3}{4}w - 3 = \frac{1}{2}w + 2$$

$(4)\frac{3}{4}w - (4)3 = (4)\frac{1}{2}w + (4)2$	2 pts to here
$3w - 12 = 2w + 8$	4 pts to here
$w - 12 = 8$	6 pts to here
$w = 20$	8 pts to here

- 11b. Solve for w and be sure to simplify your answer.

$$\frac{5}{4}w - 1 = \frac{3}{4}w + \frac{1}{2}$$

$(4)\frac{5}{4}w - 1(4) = (4)\frac{3}{4}w + (4)\frac{1}{2}$	2 pts to here
$5w - 4 = 3w + 2$	4 pts to here
$2w = 6$	6 pts to here
$w = 3$	8 pts to here

- 11c. Solve for w and be sure to simplify your answer.

$$\frac{1}{3}w + 3 = \frac{1}{5}w - \frac{1}{3}$$

$(15)\frac{1}{3}w + 3(15) = (15)\frac{1}{5}w + (15)\frac{1}{3}$	2 pts to here
$5w + 45 = 3w - 5$	4 pts to here
$2w = -50$	6 pts to here
$w = -25$	8 pts to here

- 11d. Solve for w and be sure to simplify your answer.

$$\frac{1}{4}w + \frac{1}{2} = w - \frac{7}{4}$$

$(4)\frac{1}{4}w + (4)\frac{1}{2} = 4w - (4)\frac{7}{4}$	2 pts to here
$w + 2 = 4w - 7$	4 pts to here
$-3w = -9$	6 pts to here
$w = 3$	8 pts to here

- 12a. The label of a medication bottle warns that the user must store the medication at a temperature of 25°C (centigrade). What is the temperature in degrees Fahrenheit at which the medication must be stored? Use the formula

$$F = \frac{9C + 160}{5}$$

$$F = \frac{9(25) + 160}{5}$$

4 pts to here

$$F = 77$$

6 pts to here

The medication should be stored at 77°F 8 pts to here

- 12b. The label of a medication bottle warns that the user must store the medication at a temperature of 20°C (centigrade). What is the temperature in degrees Fahrenheit at which the medication must be stored? Use the formula

$$F = \frac{9C + 160}{5}$$

$$F = \frac{9(20) + 160}{5}$$

4 pts to here

$$F = 68$$

6 pts to here

The medication should be stored at 68°F 8 pts to here

- 12c. The label of a medication bottle warns that the user must store the medication at a temperature of 15°C (centigrade). What is the temperature in degrees Fahrenheit at which the medication must be stored? Use the formula

$$F = \frac{9C + 160}{5}$$

$$F = \frac{9(15) + 160}{5}$$

4 pts to here

$$F = 59$$

6 pts to here

The medication should be stored at 59°F 8 pts to here

- 12d. The label of a medication bottle warns that the user must store the medication at a temperature of 30°C (centigrade). What is the temperature in degrees Fahrenheit at which the medication must be stored? Use the formula

$$F = \frac{9C + 160}{5}$$

$$F = \frac{9(30) + 160}{5}$$

4 pts to here

$$F = 86$$

6 pts to here

The medication should be stored at 86°F 8 pts to here

- 13a. The camera Jamie wants for her birthday is on sale at 23% off the original price. The amount of the discount is \$138. What is the original price of the camera?

Let c =cost of camera

$$0.23c = 138$$

4 pts to here

$$c = 600$$

6 pts to here

The original price of the camera is \$600 8 pts to here

- 13b. The camera Jamie wants for her birthday is on sale at 28% off the original price. The amount of the discount is \$112. What is the original price of the camera?

Let c =cost of camera

$$0.28c = 112$$

4 pts to here

$$c = 400$$

6 pts to here

The original price of the camera is \$400 8 pts to here

- 13c. Jamie bought a CD player for her car. The price had been decreased by 24%. She was able to pay \$18 less than the original cost. What was the original cost of the CD player?

Let c =cost of cd player

$$0.24c = 18$$

4 pts to here

$$c = 75$$

6 pts to here

The original price of the cd player is \$75 8 pts to here

- 13d. Jamie bought a CD player for her car. The price had been decreased by 18%. She was able to pay \$36 less than the original cost. What was the original cost of the CD player?

Let c =cost of cd player

$$0.18c = 36$$

4 pts to here

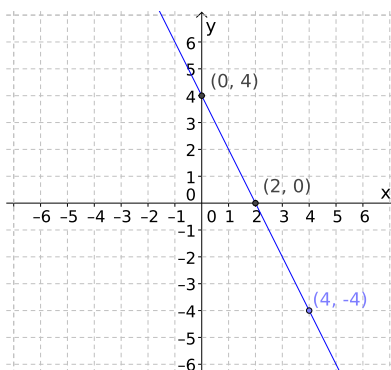
$$c = 200$$

6 pts to here

The original price of the cd player is \$200 8 pts to here

- 14a. Graph the given equation. Be sure to label axis with x , y , and with numbers. Identify and label the x -intercept, y -intercept, and another point on the line.

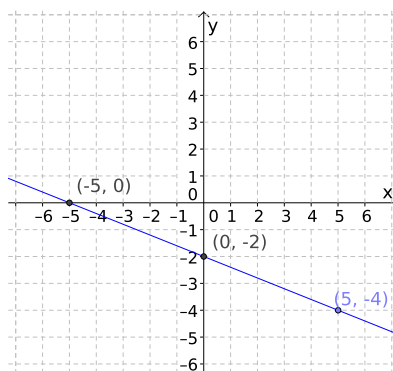
$$4y + 8x = 16$$



(2, 0) x-int	2 pts
(0, 4) y-int	2 pts
(1, 2), (-1, 6), (3, -2), (-2, 8) et al.	2 pts
x and y axis labeled	1 pt
graph	1 pt

- 14b. Graph the given equation. Be sure to label axis with x, y, and with numbers. Identify and label the x-intercept, y-intercept, and another point on the line.

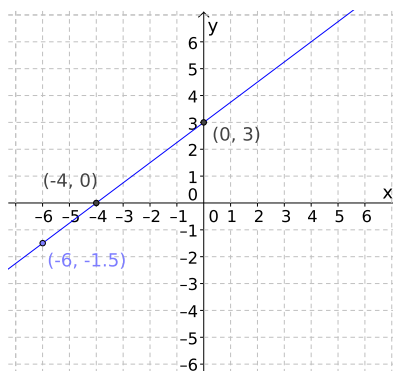
$$5y + 2x = -10$$



(-5, 0) x-int	2 pts
(0, -2) y-int	2 pts
(5, -4) et al.	2 pts
x and y axis labeled	1 pt
graph	1 pt

- 14c. Graph the given equation. Be sure to label axis with x, y, and with numbers. Identify and label the x-intercept, y-intercept, and another point on the line.

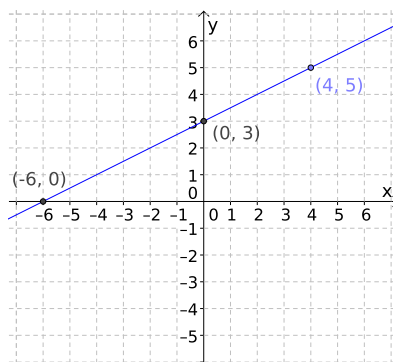
$$-4y + 3x = -12$$



$(-4, 0)$ x-int	2 pts
$(0, 3)$ y-int	2 pts
$(4, 6)$ et al.	2 pts
x and y axis labeled	1 pt
graph	1 pt

- 14d. Graph the given equation. Be sure to label axis with x, y, and with numbers. Identify and label the x-intercept, y-intercept, and another point on the line.

$$4y - 2x = 12$$



$(-6, 0)$ x-int	2 pts
$(0, 3)$ y-int	2 pts
$(-4, 1), (-2, 2), (2, 4), (4, 5), (6, 6)$ et al.	2 pts
x and y axis labeled	1 pt
graph	1 pt

- 15a. Dave has dimes and quarters in his bank. He has six more quarters than dimes. He has \$5.35 in the bank. How many coins of each type does he have?

Let $x = \#$ of dimes	
$x + 6 = \#$ of quarters	1 pt to here
$0.25(x + 6) + 0.1x = 5.35$	2 pts to here
$0.25x + 1.5 + 0.1x = 5.35$	3 pts to here
$0.35x + 1.5 = 5.35$	4 pts to here
$0.35x = 3.85$	5 pts to here
$x = 11$	6 pts to here
$y = 11 + 6 = 17$	7 pts to here
Dave has 11 dimes and 17 quarters	8 pts to here

- 15b. Dave has nickels and quarters in his bank. He has four fewer nickels than quarters. He has \$3.70 in the bank. How many coins of each type does he have?

Let $x = \#$ of quarters	
$x - 4 = \#$ of nickels	1 pt to here
$0.05(x - 4) + 0.25x = 3.70$	2 pts to here
$0.05x - 0.2 + 0.25 = 3.7$	3 pts to here
$0.30x - 0.2 = 3.7$	4 pts to here
$0.30x = 3.90$	5 pts to here
$x = 13$	6 pts to here
$y = 13 - 4 = 9$	7 pts to here
Dave has 9 nickels and 13 quarters	8 pts to here

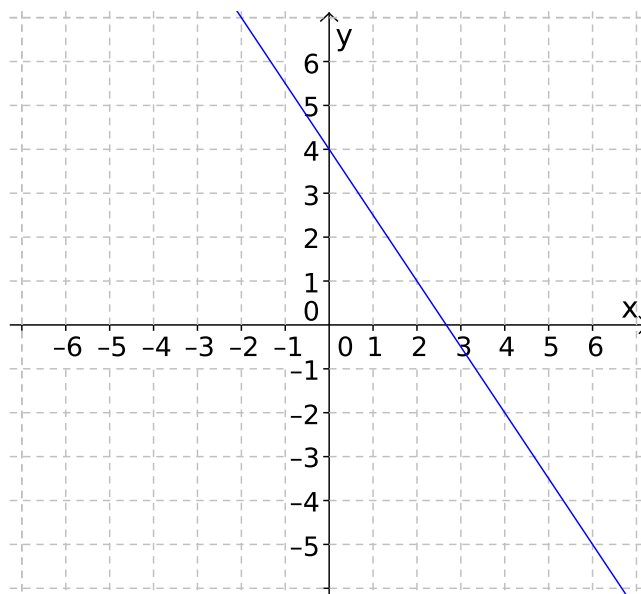
- 15c. Dave has dimes and quarters in his bank. He has one fewer quarter than dimes. He has \$2.55 in the bank. How many coins of each type does he have?

Let $x = \#$ of dimes	
$x - 1 = \#$ of quarters	1 pt to here
$0.25(x - 1) + 0.1x = 2.55$	2 pts to here
$0.25x - 0.25 + 0.1x = 2.55$	3 pts to here
$0.35x - 0.25 = 2.55$	4 pts to here
$0.35x = 2.8$	5 pts to here
$x = 8$	6 pts to here
$y = 8 - 1 = 7$	7 pts to here
Dave has 8 dimes and 7 quarters	8 pts to here

- 15d. Dave has dimes and quarters in his bank. He has one more quarter than dimes. He has \$2.35 in the bank. How many coins of each type does he have?

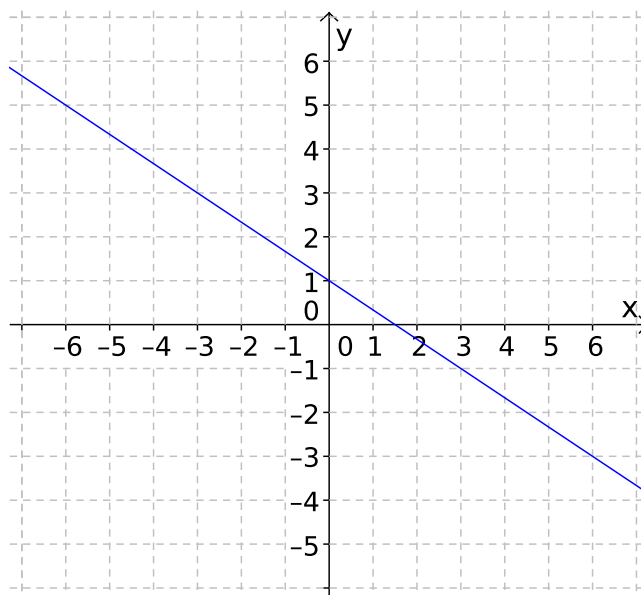
Let $x = \#$ of dimes	
$x + 1 = \#$ of quarters	1 pt to here
$0.25(x + 1) + 0.1x = 2.35$	2 pts to here
$0.25x + 0.25 + 0.1x = 2.35$	3 pts to here
$0.35x + 0.25 = 2.35$	4 pts to here
$0.35x = 2.1$	5 pts to here
$x = 6$	6 pts to here
$y = 6 + 1 = 7$	7 pts to here
Dave has 6 dimes and 7 quarters	8 pts to here

- 16a. Identify the slope and the y-intercept of the line graphed below.



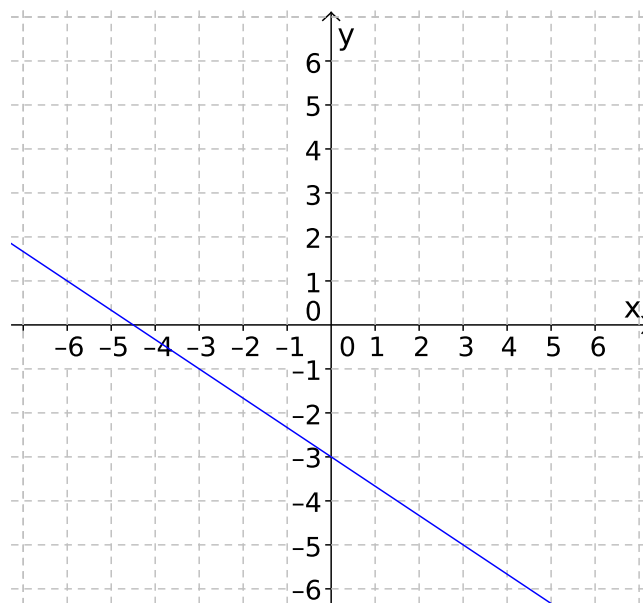
$m = -\frac{3}{2}$ or -1.5	3.5 pts
$b = 4$ or $(0, 4)$	3.5 pts

16b. Identify the slope and the y-intercept of the line graphed below.



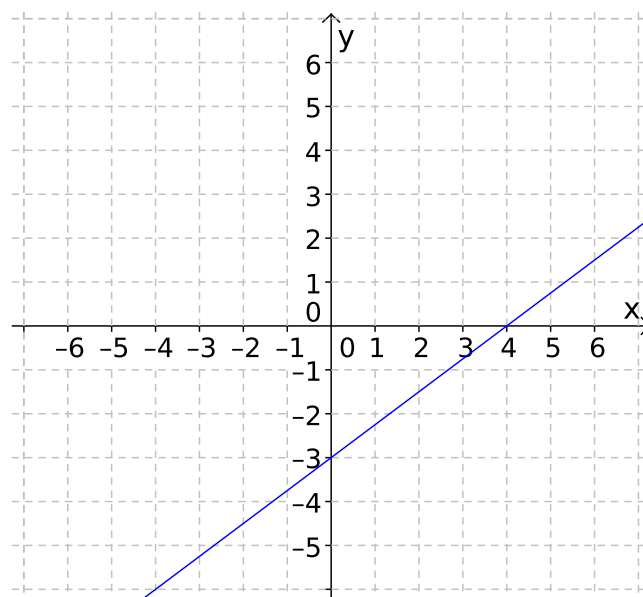
$m = -\frac{2}{3}$ or -0.67	3.5 pts
$b = 1$ or $(0, 1)$	3.5 pts

16c. Identify the slope and the y-intercept of the line graphed below.



$m = -\frac{2}{3}$ or -0.67	3.5 pts
$b = -3$ or $(0, -3)$	3.5 pts

16d. Identify the slope and the y-intercept of the line graphed below.



$m = \frac{3}{4}$ or 0.75	3.5 pts
$b = -3$ or $(0, -3)$	3.5 pts

17a. Write the equation of the line in slope-intercept form that is perpendicular to $y = -3x + 8$ and passes through the point $(9, 12)$.

$\perp m = \frac{1}{3}$	2 pts to here
$12 = \frac{1}{3}(9) + b$	3 pts to here
$12 = 3 + b$	4 pts to here
$12 - 3 = 3 - 3 + b$	5 pts to here
$9 = b$	6 pts to here
$y = \frac{1}{3}x + 9$	8 pts to here

- 17b. Write the equation of the line in slope-intercept form that is perpendicular to $y = -3x + 5$ and passes through the point $(6, 15)$.

$\perp m = \frac{1}{3}$	2 pts to here
$15 = \frac{1}{3}(6) + b$	3 pts to here
$15 = 2 + b$	4 pts to here
$15 - 2 = 2 - 2 + b$	5 pts to here
$13 = b$	6 pts to here
$y = \frac{1}{3}x + 13$	8 pts to here

- 17c. Write the equation of the line in slope-intercept form that is perpendicular to $y = -2x + 3$ and passes through the point $(6, 15)$.

$\perp m = \frac{1}{2}$	2 pts to here
$15 = \frac{1}{2}(6) + b$	3 pts to here
$15 = 3 + b$	4 pts to here
$15 - 3 = 3 - 3 + b$	5 pts to here
$12 = b$	6 pts to here
$y = \frac{1}{2}x + 12$	8 pts to here

- 17d. Write the equation of the line in slope-intercept form that is perpendicular to $y = -2x + 11$ and passes through the point $(10, 12)$.

$\perp m = \frac{1}{2}$	2 pts to here
$12 = \frac{1}{2}(10) + b$	3 pts to here
$12 = 5 + b$	4 pts to here
$12 - 5 = 5 - 5 + b$	5 pts to here
$7 = b$	6 pts to here
$y = \frac{1}{2}x + 7$	8 pts to here

- 18a. Libby's four quiz grades in her math class are 88, 80, 79, and 84. What score does she need to obtain on her fifth quiz for her quiz average to be an 85.

$\frac{88+80+79+84+x}{5} = 85$	3 pts to here
$88 + 80 + 79 + 84 + x = 85(5)$	4 pts to here
$331 + x = 425$	5 pts to here
$331 - 331 + x = 425 - 331$	6 pts to here
$x = 94$	7 pts to here
Libby must earn a 94 on her quiz	8 pts to here

- 18b. Libby's four quiz grades in her math class are 83,96,91, and 77. What score does she need to obtain on her fifth quiz for her quiz average to be an 85.

$\frac{83+96+91+77+x}{5} = 85$	3 pts to here
$83 + 96 + 91 + 77 + x = 85(5)$	4 pts to here
$347 + x = 425$	5 pts to here
$347 - 347 + x = 425 - 347$	6 pts to here
$x = 78$	7 pts to here
Libby must earn a 78 on her quiz	8 pts to here

- 18c. Libby's four quiz grades in her math class are 89,87,80, and 81. What score does she need to obtain on her fifth quiz for her quiz average to be an 85.

$\frac{89+87+80+81+x}{5} = 85$	3 pts to here
$89 + 87 + 80 + 81 + x = 85(5)$	4 pts to here
$337 + x = 425$	5 pts to here
$337 - 337 + x = 425 - 337$	6 pts to here
$x = 88$	7 pts to here
Libby must earn a 88 on her quiz	8 pts to here

- 18d. Libby's four quiz grades in her math class are 86,88,80, and 81. What score does she need to obtain on her fifth quiz for her quiz average to be an 84.

$\frac{86+88+80+81+x}{5} = 84$	3 pts to here
$86 + 88 + 80 + 81 + x = 84(5)$	4 pts to here
$335 + x = 420$	5 pts to here
$335 - 335 + x = 420 - 335$	6 pts to here
$x = 85$	7 pts to here
Libby must earn a 85 on her quiz	8 pts to here