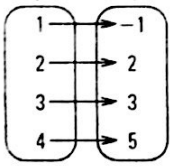
Chapter 2 Review Worksheet

Name: KEY

A.) Tell whether the relation is a function. B.) If it is a function, identify its domain and range. If it is not a function explain why it is not.

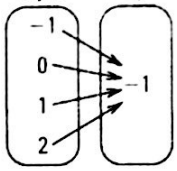
1.)



A.) function? Yes

B.)
D: {1, 2, 3, 4}
R: {−1, 2, 3, 5}

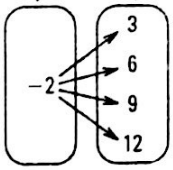
2.)



A.) function? Yes

B.)
D: {−1, 0, 1, 2}
R: {−1}

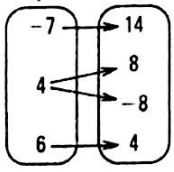
3.)



A.) function? NO

B.) The input of −2 has two different outputs.

4.)



A.) function? No

B.) The input of 4 has two different outputs.

Tell whether the lines are *parallel*, *perpendicular*, or *neither*. You must have work to back your answer.

5.) Line 1: through (5, −4) and (−4, 2)
Line 2: through (−5, −4) and (−2, −2)

Line 1:
$m = \frac{2-(-4)}{-4-5} = \frac{6}{-9} = -\frac{2}{3}$

Line 2:
$m = \frac{-2-(-4)}{-2-(-5)} = \frac{2}{3}$

neither

6.) Line 1: through (0, −4) and (−2, 2)
Line 2: through (4, −3) and (5, −6)

Line 1:
$m = \frac{2-(-4)}{-2-0} = \frac{6}{-2} = -3$

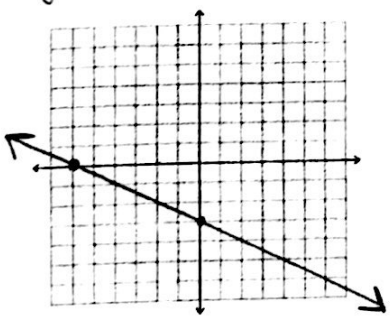
Line 2:
$m = \frac{-6-(-3)}{5-4} = \frac{-3}{1} = -3$

parallel

Graph the equation using any method. Make it clear how you graphed the equation (show your *x*/*y* chart, identify your slope/*y*-intercept, or identify your *x*/*y* intercepts).

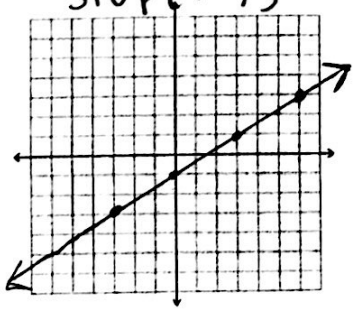
7.) $x + 2y = -6$

x-int: (−6, 0)
y-int: (0, −3)



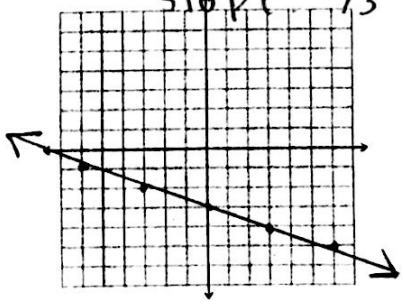
8.) $\frac{2}{3}x - 1 = y$

$y = \frac{2}{3}x - 1$
y-int: (0, −1)
slope: 2/3



9.) $-2x = 6y + 18$

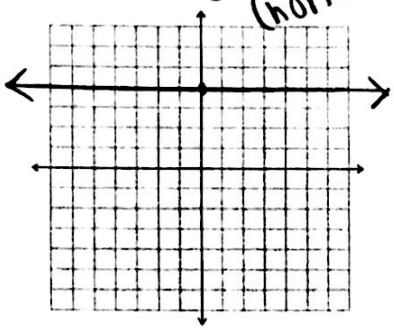
$6y = -2x - 18$
$y = -\frac{1}{3}x - 3$
y-int: (0, −3)
slope: −1/3



10.) $-3y + 12 = 0$

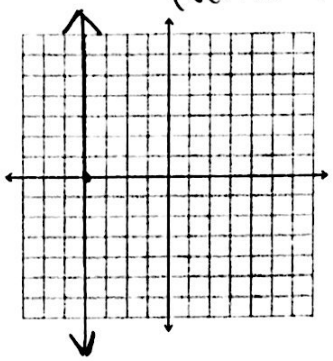
$-3y = -12$

$y = 4$ (horizontal)



11.) $\frac{-8}{2} = \frac{2x}{2}$

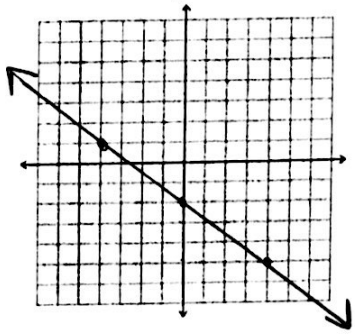
$x = -4$ (vertical)



12.) $3x + 4y = -8$

$4y = -3x - 8$ y-int: $(0, -2)$

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



Write an equation in <u>slope-intercept</u> form AND <u>standard</u> form that passes through the given point and satisfies the given criteria, or that passes through the given points. Use integer values for *A*, *B*, and *C* in standard form.

13.) $(3, 6), m = -\frac{1}{4}$

$y - 6 = -\frac{1}{4}(x - 3)$

$y - 6 = -\frac{1}{4}x + \frac{3}{4}$

$\boxed{y = -\frac{1}{4}x + \frac{27}{4}}$ S-I Form

$4\left(\frac{1}{4}x + y = \frac{27}{4}\right)$

$\boxed{x + 4y = 27}$ Standard Form

14.) $(-2, 3)$; parallel to $-8x + 2y = -6$

$2y = 8x - 6$

$y = 4x - 3$

$y - 3 = 4(x + 2)$

$y - 3 = 4x + 8$

$\boxed{y = 4x + 11}$ S-I Form

$\boxed{-4x + y = 11}$ Standard Form

15.) $(7, -2), m = 0$

$y + 2 = 0(x - 7)$

$y + 2 = 0$

$\boxed{y = -2}$ Only Form

16.) $(-1, -3), (2, 7)$

$m = \frac{7 - (-3)}{2 - (-1)} = \frac{10}{3}$

$y + 3 = \frac{10}{3}(x + 1)$

$y + 3 = \frac{10}{3}x + \frac{10}{3}$

$\boxed{y = \frac{10}{3}x + \frac{1}{3}}$ S-I Form

$3\left(-\frac{10}{3}x + y = \frac{1}{3}\right)$

$\boxed{-10x + 3y = 1}$ Standard Form

17.) $(4, -2)$; perpendicular to $y = \frac{2}{3}x - 8$

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

$y + 2 = -\frac{3}{2}x + 6$

$\boxed{y = -\frac{3}{2}x + 4}$ S-I Form

$2\left(\frac{3}{2}x + y = 4\right)$

$\boxed{3x + 2y = 8}$ Standard Form

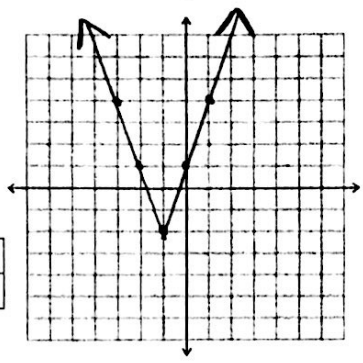
Identify the functions vertex and whether it opens up or down. Then use the table to graph the function. Compare the graph with the graph of $y = |x|$.

18.) $y = 3|x + 1| - 2$

vertex: $(-1, -2)$

opens: up

x	-3	-2	-1	0	1
y	4	1	-2	1	4



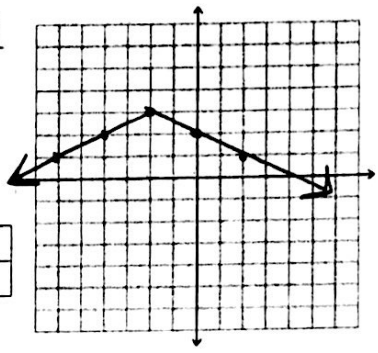
comparison:
- vertical stretch
- shift left 1, down 2

19.) $y = -\frac{1}{2}|x + 2| + 3$

vertex: $(-2, 3)$

opens: down

x	-6	-4	-2	0	2
y	1	2	3	2	1



comparison:
- reflection over x-axis
- vertical shrink
- shift left 2, up 3

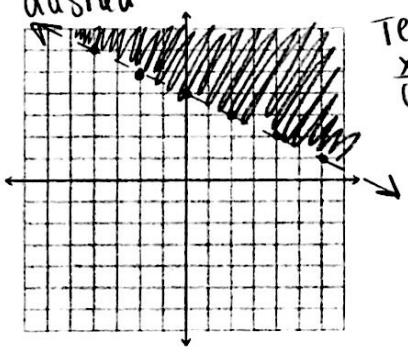
Graph the inequality in a coordinate plane.

20.) $x + 2y > 8$

$2y > -x + 8$

$y > -\frac{1}{2}x + 4$

dashed



Test:

x	y
0	0

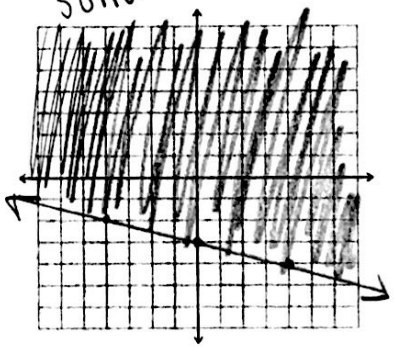
$0 > 8$ ✗

21.) $-x - 4y \leq 12$

$-4y \leq x + 12$

$y \geq -\frac{1}{4}x - 3$

solid



Test:

x	y
0	0

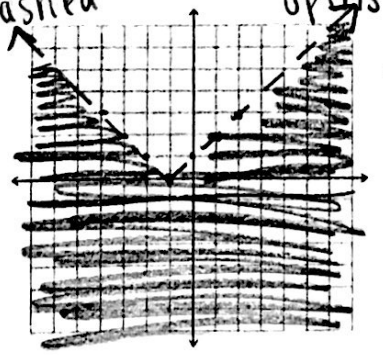
$0 \geq 12$ ✗

22.) $y < |x + 1|$

vertex: $(-1, 0)$

opens: up

dashed



Test:

x	y
0	0

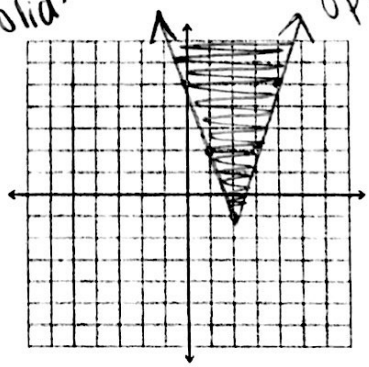
$0 < 1$ ✓

23.) $y \geq 3|x - 2| - 1$

vertex: $(2, -1)$

opens: up

solid



Test:

x	y
0	0

$0 \geq 3|-2| - 1$

$0 \geq 5$ ✗

Chapter 2 Review Worksheet

Name: KEY

A delivery service charges a base price for an overnight delivery of a package plus an extra charge for each pound the package weighs. A customer is billed $22.85 for shipping a 3-pound package and $40 for shipping a 10-pound package.

1. Identify what you have been given (1 point, 2 points, slope, y-int.). List them below.

   2 points: (3, 22.85) (10, 40)

2. Write an equation in **slope-intercept form** that gives the total cost of shipping a package as a function of the weight of the package.

   $m = \frac{40 - 22.85}{10 - 3} = \frac{17.15}{7} = 2.45$

   $y - 40 = 2.45(x - 10)$

   $y - 40 = 2.45x - 24.50$

   $\boxed{y = 2.45x + 15.50}$

3. Find the cost of shipping a 15-pound package.

   $y = 2.45(15) + 15.50$

   $y = \boxed{\$52.25}$

For a school band fundraiser, students are selling seat cushions for $4 each and licenses plate holders for $6 each. One student raises $304.

4. Write an equation in **standard form** of the line that models the possible combinations of seat cushions and license plate holders that the student sold.

   C = # of cushions
   P = # of plate holders

   $\boxed{4C + 6P = 304}$

5. If the student sold 19 seat cushions, how many license plate holders must they have sold?

   $4(19) + 6P = 304$

   $6P = 228$

   P = **38 plate holders**

6. Write an equation of a line in **slope-intercept form** that is perpendicular to $2x + 7y = 14$ and passes through $(-4, -1)$.

   $7y = -2x + 14$

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

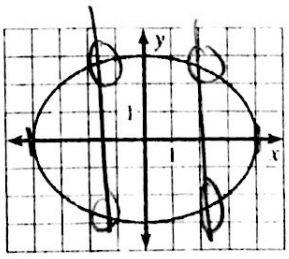
   $m = \frac{7}{2}$

   $y + 1 = \frac{7}{2}(x + 4)$

   $y + 1 = \frac{7}{2}x + 14$

   $\boxed{y = \frac{7}{2}x + 13}$

7. Identify the domain and range of the graph.
   Does the graph represent a function? *Explain* how you know.



D: $[-4, 4]$

R: $[-3, 3]$

Not a function. Doesn't pass the vertical line tes

8. Without graphing, compare the graph of $y = -\frac{1}{4}|x + 9| - 5$ to the graph of $y = |x|$.

- shift down 5
- shift left 9
- vertical shrink
- reflection over x-axis

A cable company charges $44 per month for basic service. Each premium channel costs an additional $16 per month.

9. Write an equation in **slope-intercept form** that gives the total cost (in dollars) of cable each month as a function of the number of premium channels purchased.

$y = 16x + 44$

10. Identify the dependent and independent variables in this situation.

dependent: the cost of cable service
independent: the # of premium channels purchased per month.

11. Find the cost of cable service for a month in which you purchase 4 premium channels.

$y = 16(4) + 44$
$y = \$108$

During the period 1990-2004, the annual sales of a small company increased by the same amount each year. In 1997, the annual sales were $97,000. By 2002, sales had increased to $147,000.

(7, 97,000) (12, 147,000)

12. Write a linear equation in **slope-intercept form** that models the annual sales as a function of the number of years since 1990.

$m = \frac{147,000 - 97,000}{12 - 7} = \frac{50,000}{5} = 10,000$

$y - 97,000 = 10,000(x - 7)$
$y - 97,000 = 10,000x - 70,000$
$y = 10,000x + 27,000$

13. Use the model to predict the sales in 2016.

$y = 10,000(16) + 27,000$
$y = \$187,000$

A BMX race track charges a one time membership fee and an entrance fee per race. One racer paid a total of $76 after 3 races. Another racer paid a total of $124 after 7 races.

(3, 76) (7, 124)

14. Write an equation in **slope-intercept form** that gives the total cost, C, as a function of the number or races entered, r.

$m = \frac{124 - 76}{7 - 3} = \frac{48}{4} = 12$

$y - 76 = 12(x - 3)$
$y - 76 = 12x - 48$
$C = 12r + 28$

15. What is the entry fee per race?

$\$12$

16. How much does the track membership cost?

$\$28$

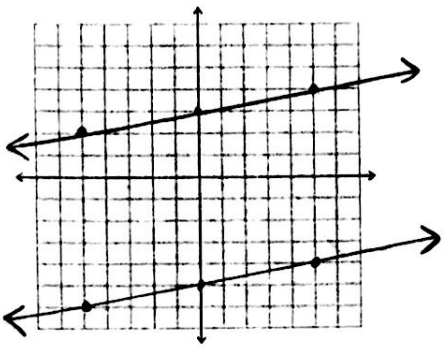
Chapter 3 Review Worksheet #1 (Skills)

Name: KEY

Solve the linear system by graphing (show me how you graphed). Remember, you must check your solution algebraically. Then classify the system as *consistent and independent*, *consistent and dependent*, or *inconsistent*.

1.) $-x + 5y = 15$ → $5y = x + 15$, $y = \frac{1}{5}x + 3$

$y = \frac{1}{5}x - 5$



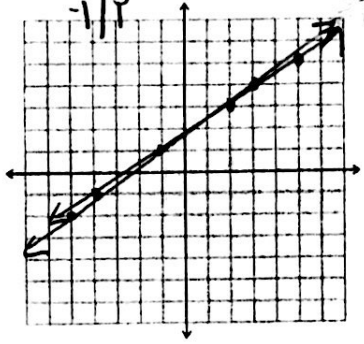
solution: NO SOLUTION

classify: INCONSISTENT

2.) $-2x + 3y = 5$ → $3y = 2x + 5$, $y = \frac{2}{3}x + 1.67$

$y = \frac{3}{4}x + \frac{7}{4}$

x	y
-1	1
2	3

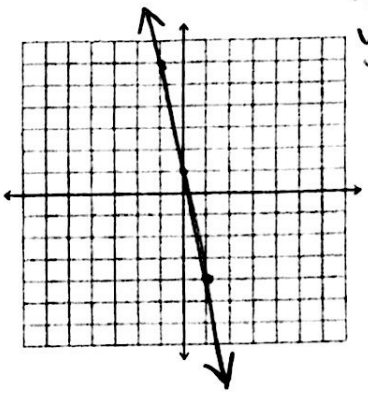


solution: (-1, 1)

classify: CONSISTENT INDEPENDENT

3.) $2y - 2 = -10x$ → $2y = -10x + 2$, $y = -5x + 1$

$-20x - 4y = -4$ → $-4y = 20x - 4$, $y = -5x + 1$



solution: INFINITELY MANY

classify: CONSISTENT DEPENDENT

Solve the linear system using substitution.

4.) $8x + 2y = 2$

$x + 3y = 14$ → $x = 14 - 3y$

$8(14 - 3y) + 2y = 2$

$112 - 24y + 2y = 2$

$112 - 22y = 2$

$-22y = -110$

$y = 5$

$x = 14 - 3(5)$

$x = -1$

(-1, 5)

5.) $7x - 3y = 6$

$-2x + 5y = -10$ → $-2x = -10 - 5y$

$x = 5 + 2.5y$

$7(5 + 2.5y) - 3y = 6$

$35 + 17.5y - 3y = 6$

$35 + 14.5y = 6$

$14.5y = -29$

$y = -2$

$x = 5 + 2.5(-2)$

$x = 0$

(0, -2)

Solve the linear system using elimination.

6.) $3x = 8y$

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

$2(3x - 8y = 0)$

$-6x + 15y = -6$

$+\ 6x - 16y = 0$

$-y = -6$

$y = 6$

$3x = 8(6)$

$3x = 48$

$x = 16$

$(16, 6)$

7.) $4(4x - 10y = 18)$

$-16x + 40y = -45$

$+\ 16x - 40y = 72$

$0 \neq 27$

no solution

Graph the system of inequalities.

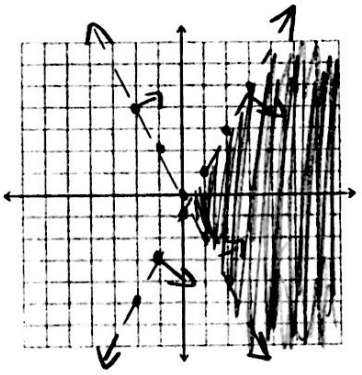
8.) $y > -2x$ dashed

$2x - y > 1$

$-y > -2x + 1$

$y < 2x - 1$

dashed



9.) $4x + 4y \geq -4$ solid

$-2x + 2y \geq -4$ solid

$y \geq 0$

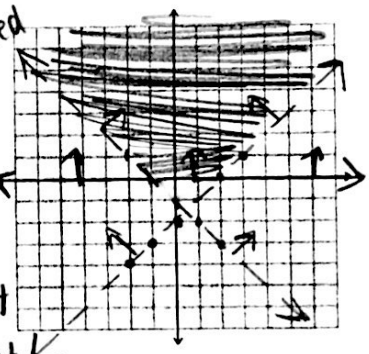
$4y > -4x - 4$

$y > -x - 1$

$-2x + 2y > -4$

$2y > 2x - 4$

$y > x - 2$



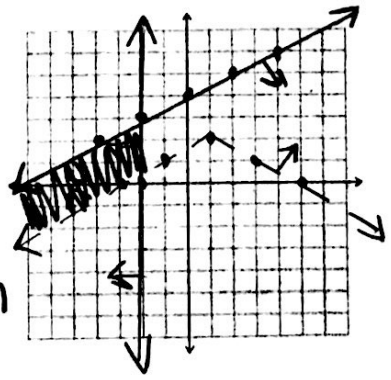
10.) $y \geq -\frac{1}{2}|x - 1| + 2$ solid

$x \leq -2$ solid (vertical)

$y \leq \frac{1}{2}x + 4$ solid

vertex: (1, 2)

opens: down



Solve the linear system using any algebraic method.

11.) $8x - 2y + z = -6$
$2(-x + 3y - 2z = -15)$
$3x - y + 4z = 13$

elim z

$16x - 4y + 2z = -12$
$+ \quad -x + 3y - 2z = -15$
$15x - y = -27$

$-2x + 6y - 4z = -30$
$+ \quad 3x - y + 4z = 13$
$x + 5y = -17$

$5(15x - y = -27)$
$x + 5y = -17$
$+$
$75x - 5y = -135$
$76x = -152$
$x = -2$

$-2 + 5y = -17$
$5y = -15$
$y = -3$

$-(-2) + 3(-3) - 2z = -15$
$2 - 9 - 2z = -15$
$-2z = -8$
$z = 4$

solution: $(-2, -3, 4)$

12.) $10x + 2y - 2z = 12$
$2x + 2y + 2z = 4$
$3x + y = 4$

elim z

$10x + 2y - 2z = 12$
$+ \quad 2x + 2y + 2z = 4$
$12x + 4y = 16$

$12x + 4y = 16$
$-4(3x + y = 4)$
$-12x - 4y = -16$
$+$
$12x + 4y = 16$
$0 = 0$

solution: INFINITELY MANY SOLUTIONS

13.) $x + y - z = 7$
$2(2x - 3y + z = 2)$
$4x + 2y - 2z = 20$

elim z

$x + y - z = 7$
$+ \quad 2x - 3y + z = 2$
$3x - 2y = 9$

$4x - 6y + 2z = 4$
$+ \quad 4x + 2y - 2z = 20$
$8x - 4y = 24$

$-2(3x - 2y = 9)$
$8x - 4y = 24$
$+$
$-6x + 4y = -18$
$2x = 6$
$x = 3$

$3(3) - 2y = 9$
$9 - 2y = 9$
$-2y = 0$
$y = 0$

$3 + 0 - z = 7$
$3 - z = 7$
$-z = 4$
$z = -4$

solution: $(3, 0, -4)$

Chapter 3 Review Worksheet #2 (Word Problems) *Name:* KEY

1.) You purchase a gym for $115,000. The estimated monthly revenue is $5,500 and expected monthly costs are $3,200.

a.) Let R represent the revenue during the first t months of operation. Write a linear model for R.

$R = 5,500t$

t	R
20	110,000
40	220,000

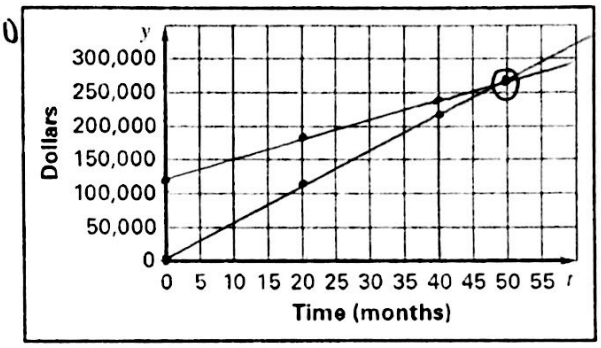
b.) Let C represent the costs during the first t months of operation, including the purchase price. Write a linear model for C.

$C = 3,200t + 115,000$

t	C
20	179,000
40	243,000

c.) Graph the revenue and cost linear models on the same coordinate plane. Be sure to check your solution. $5,500(50) = 275,000$ ✓

$3,200(50) + 115,000 = 275,000$



d.) How many months will it take until revenue and costs are equal?

50 months,
$275,000 revenue

2.) A math test is to have 20 total questions. The test format uses multiple choice questions worth 4 points each, and problem solving questions that are worth 6 points each. The test is worth a total of 100 points.

a.) Write a system of equations to determine how many of each type of question is used. Be sure to define your variables.

x = # of multiple choice

y = # of problem solving

$x + y = 20$

$4x + 6y = 100$

b.) Solve your system by graphing. Set your x- and y-axis to go by two. Be sure to check your solution.

$x + y = 20$

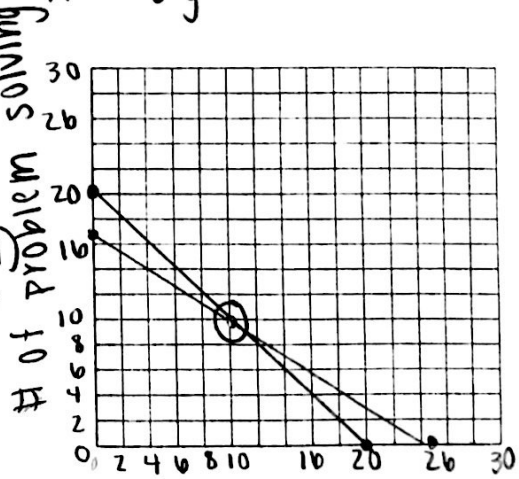
x-int: (20, 0)

y-int: (0, 20)

$4x + 6y = 100$

x-int: (25, 0)

y-int: (0, 16.7)



c.) How many of each type of question were on the test?

$10 + 10 = 20$

$20 = 20$ ✓

$4(10) + 6(10) = 100$

$40 + 60 = 100$

$100 = 100$ ✓

10 multiple choice
10 problem solving

3.) A hair salon receives a shipment of 84 bottles of hair conditioner to use and sell to customers. The two types of conditioners received are type A, which is used for regular hair, and type B, which is used for frizzy hair. Type A costs $6.50 per bottle and type B costs $8.25 per bottle. The hair salon's invoice for the conditioner is $588.

Set up and solve a system of equations to find how many of each type of conditioner are in the shipment. Remember to define your variables.

x = # of Type A bottles
y = # of Type B bottles

$x + y = 84$
$6.5x + 8.25y = 588$

60 Type A bottles
24 Type B bottles

$x + y = 84$
$y = 84 - x$

$6.5x + 8.25(84 - x) = 588$
$6.5x + 693 - 8.25x = 588$
$-1.75x = -105$
$x = 60$

$y = 84 - 60$
$y = 24$

4.) In order to connect your Blueray player to your TV set, you need a cable with a special adapter at both ends. An 8 foot cable costs $24.50 and a 4 foot cable costs $15.50. The total cost is the sum of the cost of the adapters and the cost of the cable itself.

Set up and solve a system of equations to find the per foot cost of the cable and the fixed cost of the special adapters. Remember to define your variables.

x = cost per foot
y = cost for adapters

$24.50 = 8x + y$
$15.50 = 4x + y \rightarrow -1(15.50 = 4x + y)$

$-15.50 = -4x - y$
$24.50 = 8x + y$
$9 = 4x$
$x = 2.25$

$15.50 = 4(2.25) + y$
$y = 6.50$

$2.25 per foot cost
$6.50 adapter cost

What would you expect to pay for a 6 foot cable?

$C = 2.25x + 6.50$ $C = 2.25(6) + 6.50$ $C = \$20$

5.) The cost of 11 gallons of regular gasoline and 16 gallons of premium gasoline is $58.55. Premium costs $0.20 more per gallon than regular. What is the cost of a gallon of regular and premium gasoline?

x = cost of 1 gallon (regular)
y = cost of 1 gallon (premium)

$11x + 16y = 58.55$
$y = x + 0.20$

$11x + 16(x + 0.2) = 58.55$
$11x + 16x + 3.2 = 58.55$
$27x = 55.32$
$x = 2.05$

$y = 2.05 + 0.20$
$y = 2.25$

$2.05 for 1 gal. regular
$2.25 for 1 gal. premium

6.) You and a group of friends went to the Brewer's game. During the 3rd inning, you made a run to the concession stands to buy food for everybody. You bought 5 cheeseburgers and 3 hot dogs for $29.25. When you get back to your seat you're trying to figure out what everybody owes, but cannot remember the price of a cheeseburger or hot dog. You do remember that the cheeseburger cost twice as much as the hot dog. What is the cost of a hamburger? a hot dog?

x = cost of hamburger
y = cost of hot dog

$5x + 3y = 29.25$
$x = 2y$

$5(2y) + 3y = 29.25$
$10y + 3y = 29.25$
$13y = 29.25$
$y = 2.25$

$x = 2(2.25)$
$x = 4.50$

A burger costs $4.50 & a hot dog costs $2.25

7.) For an upcoming concert, a 2500 seat arena is selling tickets for $25 and $15. At least 1000 tickets must be priced at $15 and total sales need to exceed $10,000 to make a profi t. Let x represent the number of tickets priced at $25 and y represent the number of tickets priced at $15. Write a system of inequalities that shows the possible combinations of ticket sales in order to make a profit.

x = # of $25 tickets
y = # of $15 tickets

$x + y \leq 2500$
$25x + 15y > 10{,}000$
$y \geq 1000$
$x \geq 0$

8.) The feed mill pays a farmer $6930.00 for the 1st delivery, $5475.00 for the 2nd delivery, and $8879.50 for the 3rd delivery. The table shows the number of bushels included in each delivery. Use the table to write and solve a system of equations to fi nd the price per bushel that the farmer received for each crop.

x = $/bushel of corn
y = $/bushel of wheat
z = $/bushel of soybeans

Delivery	Corn	Wheat	Soybeans
1st Delivery	900	540	360
2nd Delivery	1125	150	225
3rd Delivery	860	645	645

$900x + 540y + 360z = 6930$
$1125x + 150y + 225z = 5475$
$860x + 645y + 645z = 8879.50$

$\rightarrow z = -2.5x - 1.5y + 19.25$

$1125x + 150y + 225(-2.5x - 1.5y + 19.25) = 5475$
$1125x + 150y - 562.5x - 337.5y + 4331.25 = 5475$
$562.5x - 187.5y = 1143.75$

$860x + 645y + 645(-2.5x - 1.5y + 19.25) = 8879.50$
$860x + 645y - 1612.5x - 967.5y + 12416.25 = 8879.50$
$-752.5x - 322.5y = -3536.75$

$562.5x - 187.5y = 1143.75$
$-187.5y = -562.5x + 1143.75$
$y = 3x - 6.1$

$-752.5x - 322.5(3x - 6.1) = -3536.75$
$-752.5x - 967.5x + 1967.25 = -3536.75$
$-1720x = -5504$
$x = 3.2$

$y = 3(3.2) - 6.1$
$y = 3.5$

$z = -2.5(3.2) - 1.5(3.5) + 19.25$
$z = 6$

$3.20/bushel of corn, $3.50/bushel of wheat, $6/bushel of soybeans

9.) The movie theater charges different rates for attendees depending on their age; children 12 and under are $4, adults are $6 and senior citizens over 65 are $5. A group of 14 people from a family decides to go to the movies one weekend. There are an equal number of senior citizens as children 12 and under. The total cost was $66. Let x represent the number of children 12 and under. Let y represent the number of adults. Let z represent the number of senior citizens.

Write and solve a system of linear equations in three variables to find the number of people in each age category in the group.

x = # of kids tickets
y = # of adult tickets
z = # of senior tickets

$x + y + z = 14$
$4x + 6y + 5z = 66$
$x = z$

$x + y + x = 14$
$2x + y = 14$

$4x + 6y + 5x = 66$
$9x + 6y = 66$

$-6(2x + y = 14)$
$+ \quad 9x + 6y = 66$
$-12x - 6y = -84$
$-3x = -18$

$x = 6$ $\quad z = 6$

$9(6) + 6y = 66$
$54 + 6y = 66$
$6y = 12$
$y = 2$

6 kid tickets
2 adult tickets
6 senior tickets

10.) A cashier has 25 coins consisting of nickels, dimes, and quarters with a value of $4.90. If the number of dimes is 1 less than twice the number of nickels, how many of each type of coin does she have?

x = # of nickels
y = # of dimes
z = # of quarters

$x + y + z = 25$
$y = 2x - 1$
$0.05x + 0.10y + 0.25z = 4.90$

$x + (2x - 1) + z = 25$
$3x + z = 26$

$0.05x + 0.10(2x - 1) + 0.25z = 4.90$
$0.05x + 0.2x - 0.1 + 0.25z = 4.90$
$0.25x + 0.25z = 5$

$-0.25(3x + z = 26)$
$+ \quad 0.25x + 0.25z = 5$
$-0.75x - 0.25z = -6.5$
$-0.5x = -1.5$

$x = 3$

$3(3) + z = 26$
$9 + z = 26$
$z = 17$

$y = 2(3) - 1$
$y = 5$

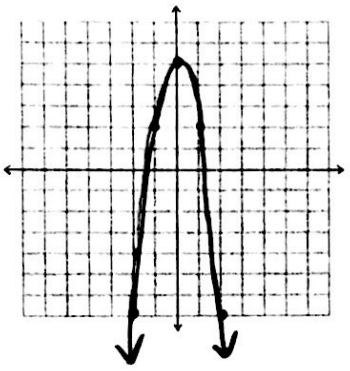
3 Nickels
5 Dimes
17 Quarters

Review Lessons 4.1-4.5 Worksheet

Name: KEY

Graph the function by completing the table. Identify the graph's axis of symmetry, vertex, whether the graph opens up or down, and its maximum/minimum value. Then compare the graph with the graph of $y = x^2$.

1.) $y = -3x^2 + 5$



AOS: $x = 0$

vertex: $(0, 5)$

opens: down

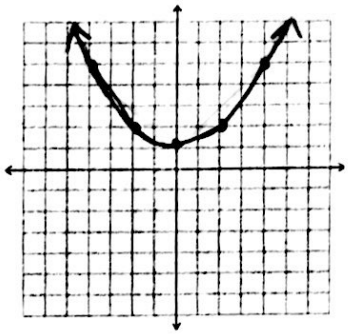
(max.)/min. value:

$y = 5$

x	-2	-1	0	1	2
y	-7	2	5	2	-7

comparison to $y = x^2$:
- reflection over x-axis
- vertical stretch
- shift up 5

2.) $y = \frac{1}{4}x^2 + 1$



AOS: $x = 0$

vertex: $(0, 1)$

opens: up

max./(min.) value:

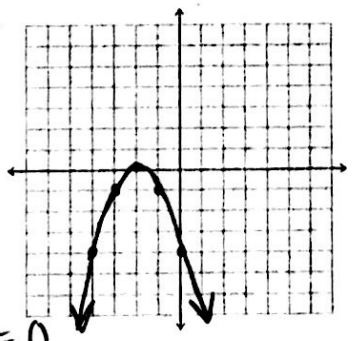
$y = 1$

x	-4	-2	0	2	4
y	5	2	1	2	5

comparison to $y = x^2$:
- vertical shrink
- shift up 1

Identify the graph's axis of symmetry, vertex, *y*-intercept, whether the graph opens up or down, and its maximum/minimum value. Then graph the function by completing the table.

3.) $y = -x^2 - 4x - 4$



AOS: $x = -2$

vertex: $(-2, 0)$

y-int: $(0, -4)$

opens: down

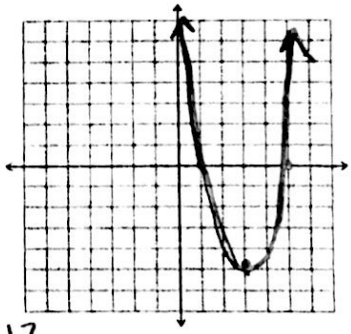
(max.)/min. value: $y = 0$

x	-4	-3	-2	-1	0
y	-4	-1	0	-1	-4

work:

$x = \frac{-b}{2a} = \frac{-(-4)}{2(-1)} = \frac{4}{-2} = -2$

4.) $y = 3x^2 - 18x + 15$



AOS: $x = 3$

vertex: $(3, -12)$

y-int: $(0, 15)$

opens: up

max./(min.) value: $y = -12$

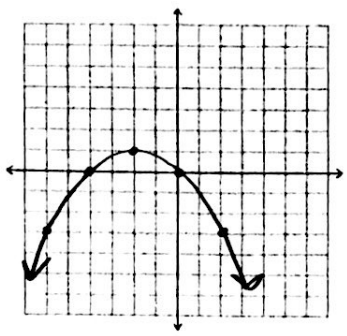
y-axis by 2

x	1	2	3	4	5
y	0	-9	-12	-9	0

work:

$x = \frac{-(-18)}{2(3)} = \frac{18}{6} = 3$

5.) $y = -\frac{1}{4}(x+2)^2 + 1$



AOS: $x = -2$

vertex: $(-2, 1)$

y-int: $(0, 0)$

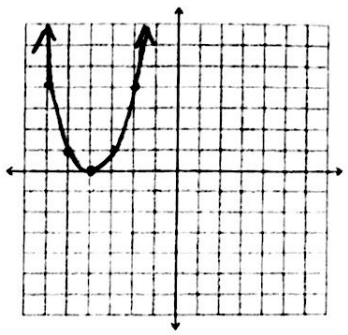
opens: down

max./min. value: $y = 1$

x	-6	-4	-2	0	2
y	-3	0	1	0	-3

work:

6.) $y = (x+4)^2$



AOS: $x = -4$

vertex: $(-4, 0)$

y-int: $(0, 16)$

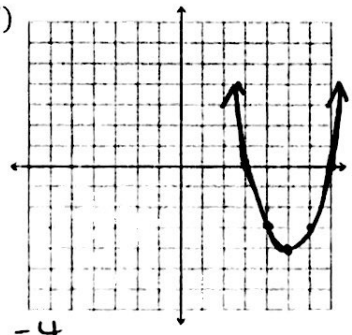
opens: up

max./min. value: $y = 0$

x	-6	-5	-4	-3	-2
y	4	1	0	1	4

work:

7.) $y = (x-3)(x-7)$



AOS: $x = 5$

vertex: $(5, -4)$

y-int: $(0, 21)$

opens: up

max./min. value: $y = -4$

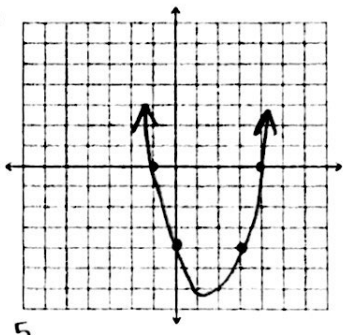
x	3	4	5	6	7
y	0	-3	-4	-3	0

work:

$x = \frac{p+q}{2} = \frac{3+7}{2} = \frac{10}{2} = 5$

x-int: $(3,0)$ $(7,0)$

8.) $f(x) = 2(x-4)(x+1)$



AOS: $x = 1.5$

vertex: $(1.5, -12.5)$

y-int: $(0, -8)$

opens: up

max./min. value: $y = -12.5$

y-axis by 2

x	-1	0	1.5	3	4
y	0	-8	-12.5	-8	0

work:

$x = \frac{4+-1}{2} = \frac{3}{2} = 1.5$

x-int: $(4,0)$ $(-1,0)$

Factor the expression completely, if possible.

9.) $x^2 - 4x + 4$ $\quad -4$ / $-2 + -2 = -4$

$(x-2)(x-2)$

10.) $t^2 - 11t - 26$ $\quad -26$ / $-13 + 2 = -11$

$(t-13)(t+2)$

11.) $b^2 - 400$ * difference of two squares

$(b)^2$ $(20)^2$

$(b+20)(b-20)$

*AC method

12.) $4t^2 + 8t + 3$ $4 \cdot 3 = 12$, $6 + 2 = 8$

$4t^2 + 6t + 2t + 3$

$2t(2t+3) + 1(2t+3)$

$\boxed{(2t+3)(2t+1)}$

13.) $3r^2 + 9r - 4$ $3 \cdot -4 = -12$, $? = 9$

cannot be factored

14.) $6x^2 + x - 15$ $6 \cdot -15 = -90$, $1 = -9 + 10$

$6x^2 + 10x - 9x - 15$

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

$\boxed{(3x+5)(2x-3)}$

Solve the equation using factoring.

*perfect square trinomial

15.) $8t^2 + 38t - 10 = 0$ $4 \cdot -5 = -20$, $20 + -1 = 19$

$2(4t^2 + 19t - 5) = 0$

$4t^2 + 20t - t - 5 = 0$

$4t(t+5) - 1(t+5) = 0$

$(t+5)(4t-1) = 0$

$t+5=0$ $\quad 4t-1=0$

$\boxed{t=-5}$ $\quad \boxed{t=1/4}$

16.) $25x^2 - 80x + 64 = 0$ $(5x)^2$, $2(5x \cdot 8)$, $(8)^2$

$(5x-8)^2 = 0$

$\sqrt{(5x-8)^2} = \sqrt{0}$

$5x - 8 = 0$

$\boxed{x = 8/5}$

17.) $r^2 + 2r = 80$ -80, $-8 + 10 = 2$

$r^2 + 2r - 80 = 0$

$(r+10)(r-8) = 0$

$r+10=0$ $\quad r-8=0$

$\boxed{r=-10}$ $\quad \boxed{r=8}$

Find the zeros of the quadratic function.

*difference of squares

18.) $y = x^2 - 8x + 16$ 16, $-4 + -4 = -8$

$0 = x^2 - 8x + 16$

$0 = (x-4)^2$

$\sqrt{0} = \sqrt{(x-4)^2}$

$0 = x - 4$

$\boxed{x=4}$

19.) $f(x) = -16n^2 + 12n$

$0 = -16n^2 + 12n$

$0 = -4n(4n-3)$

$-4n=0$ $\quad 4n-3=0$

$\boxed{n=0}$ $\quad \boxed{n=3/4}$

20.) $y = 16x^2 - 1$

$0 = 16x^2 - 1$

$0 = (4x+1)(4x-1)$

$4x+1=0$ $\quad 4x-1=0$

$\boxed{x=-1/4}$ $\quad \boxed{x=1/4}$

Write the expression in simplest radical form.

21.) $\sqrt{98}$

$\sqrt{49}\ \sqrt{2}$

$\boxed{7\sqrt{2}}$

22.) $\sqrt{27}$

$\sqrt{9}\ \sqrt{3}$

$\boxed{3\sqrt{3}}$

23.) $\sqrt{10} \cdot \sqrt{15}$

$\sqrt{150}$

$\sqrt{25}\ \sqrt{6}$

$\boxed{5\sqrt{6}}$

24.) $3\sqrt{8} \cdot \sqrt{28}$

$3\sqrt{224}$

$3\ \sqrt{16}\ \sqrt{14}$

$3 \cdot 4 \cdot \sqrt{14}$ $\quad \boxed{12\sqrt{14}}$

25.) $\sqrt{\frac{11}{25}}$

$\frac{\sqrt{11}}{\sqrt{25}}$

$\boxed{\frac{\sqrt{11}}{5}}$