Bunker Hill Community College

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GUIDED SELF-PLACEMENT MATH TEST STUDY GUIDES

December 2023

CHARLESTOWN CAMPUS
250 New Rutherford Avenue • Boston, Massachusetts 02129-2925
Phone: 617-228-2000 TTY: 617-242-2365

CHELSEA CAMPUS
70 Everett Avenue • Chelsea, Massachusetts 02150-2917
Phone: 617-228-2101 TTY: 617-884-3293

ADDITIONAL LOCATIONS
Chinatown • East Boston • Everett • Malden • South End • Quincy
bhcc.edu

GSP MATH STUDY GUIDE

TEST 0: FOUNDATIONS OF ALGEBRA READINESS CHECK

TEST 1: COLLEGE MATH READINESS CHECK

TEST 2: COLLEGE ALGEBRA READINESS CHECK

HOW THE TEST WORKS:

Start with TEST 1 (13 questions/90 minutes).

- ➢ If your score is 84% or more (11 or more correct) ➔ placement is MAT 099
  ➔You have the option of taking **TEST 2** for a higher placement.
- ➢ Less than 84% /11 correct= take **TEST 0**

TEST 0 (13 questions/90 minutes)

- ➢ 84% or more (11 or more correct) ➔placement is MAT 097
- ➢ Less than 84% = placement is MAT 093

TEST 2 (13 questions/90 minutes)

- ➢ 84% or more (11 or more correct) ➔placement is MAT 194
- ➢ Less than 84% ➔placement is MAT 099

The Guided Self-Placement Math Test is taken online. If you would like to try an online version of the practice visit www.bhcc.edu/assessment/collegeplacementtesting/newcollegestudents/.

Precalculus and Calculus: Students who want to take Precalculus (MAT 197) or Calculus (MAT 281) should take the Accuplacer math test instead of the Guided Self-Placement Math Test. For instructions go to www.bhcc.edu/assessment/collegeplacementtesting/newcollegestudents/.

Study Guide for Test 0: "Foundations of Algebra Readiness Check" (MAT093 Skills)

Work through this study guide to help you prepare for the "Foundations of Algebra Readiness Check", or "Test 0". This content aligns with the MAT093 (Foundations of Mathematics) course offered at BHCC. You will need to score an 84% or higher on the actual test to enroll in MAT097 (Foundations of Algebra).

1. Find the area of the rectangle shown

$7\frac{3}{4}$ ft

$3\frac{1}{2}$ ft
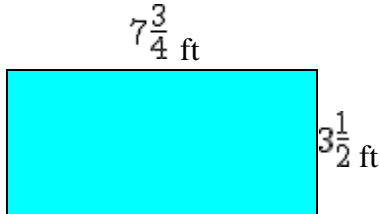
_____ square feet

2. If elephant grass grows $3\frac{1}{2}$ inches a day, how many inches will it grow in 9 days?

_____ inches

3. It took Danna $4\frac{3}{4}$ hours to get from Portland to Kansas City. Then it took Danna another $5\frac{4}{5}$ hours to get from Kansas City to Sacramento. How long did Danna travel in total? *Write your answer as a mixed number. Remember to type $3\frac{2}{5}$, enter 3_2/5.*

Danna traveled a total of _____ hours.

4. A chewy fruit bar recipe calls for $10\frac{7}{10}$ cups of brown sugar and $8\frac{8}{9}$ cups of granulated sugar.

How many cups of sugar are in the recipe?

There are _____ cups in the recipe.

How many **MORE** cups of brown sugar are there then granulated sugar?

There are _____ more cups of brown sugar.

5. Suppose you work for a large coffee distributor that has a secret coffee blend it sells to local stores. You mix the Gazebo blend with the Tanzanian blend, but always in the same proportion. Yesterday, you mixed 130 pounds of the Gazebo blend with 247 pounds of the Tanzanian blend. Today, there is 60 pounds of the Gazebo coffee left in stock. How many pounds of the Tanzanian

coffee should you mix with it to get your secret blend?

Answer: _____ pounds

6. In Tacoma, the tax on a property assessed at $840,000 is $15,960. If tax rates are proportional in this city, how much would the tax be on a property assessed at $380,000?

Answer: $ _____

7. Solve the proportion

$$\frac{30}{39} = \frac{x}{34}$$

(round to the hundredths place)

_____

8. Find the unknown number in the proportion

$$\frac{4}{7} = \frac{x}{158}$$

Round your answer to the nearest hundredth.

_____

9. A person who wants to get in shape goes to a local gym that advertises 64 training sessions for $1105. Find the cost of 162 training sessions.

Round your answer to the nearest cent.

$_____

10. Solve the proportion. Leave the answer as a fraction.

$$\frac{25}{2} = \frac{8}{x}$$

$x =$ _____

11. If the first chapter of a certain book is 26 pages long and makes up 2% of the book, how many pages does the entire book have?

_____ pages

12. What is 65 percent of 280 ?

Your answers is : _____

13. 8.2% of 35 is what number?
_____

14. 120% of 110 is what number?
_____

15. If the sales tax rate for the state of Arizona was 7.5%, what would the state sales tax on a $2,400 car be in Arizona?
$_____

What would the final cost of the car, including tax, be?
$_____

16. The sales tax rate for South Salt Lake is 7.05%.

What is the state sales tax on a $26,500 car in South Salt Lake?

$_____

What is the final cost of the car, including tax?

$_____

The sales tax rate for Morgan County is 5.95%.

What is the state sales tax on that same car purchase in Morgan County?

$_____

What is the final cost of the car in Morgan County, including tax?

$_____

How much money would you save by driving to Morgan County to purchase the vehicle?

$_____

17. Divide. Write your answer in lowest terms.

$$\frac{5}{6} \div \frac{13}{5}$$

_____

18. Divide and simplify: $\frac{8}{7} \div 24$ = _____

Write all products as integers or reduced fractions - **NOT MIXED NUMBERS**.

If the expression is undefined use the word undefined in the answer box.

19. Subtract: $\frac{9}{28} - \frac{5}{42}$

_____

20. Subtract: $\frac{1}{6} - \frac{11}{14}$

Give your answer in reduced terms.

_____

21. Solve each proportion:

(round answers to nearest tenth)

$$\frac{x}{23} = \frac{57}{11}$$

$x =$ _____

$$\frac{43 \ \text{women}}{54 \ \text{men}} = \frac{15 \ \text{women}}{n \ \text{men}}$$

(round answers to nearest whole person)

$n =$ _____

22. Solve for the variable in $\dfrac{\frac{3}{4}}{x} = \dfrac{1.75}{\frac{7}{5}}$

$x =$ _____

23. Find the least common multiple of 55 and 30 using the prime factors method.

_____

24. Find the least common multiple of 7 and 11

_____

25. Solve for the variable in $\dfrac{x}{1\frac{1}{4}} = \dfrac{2.8}{13\frac{1}{3}}$

$x =$ _____

26. A person who wants to get in shape goes to a local gym that advertises 85 training sessions for $923. Find the cost of 127 training sessions.

Round your answer to the nearest cent.

$_____

27. 31 % is equivalent to what decimal value?

_____

28. 5.9% is equivalent to what fraction in reduced terms?

_____

29. After visiting the Titanic, Captain Brain and Mr. Pinky are taking the Alvin submarine back to the surface of the water. After ascending for 3 hours, they are 1898 feet below the surface of the water. Then, at 8 hours they are 1728 feet below the surface. (Note: under the water is negative)

What is the rate of the submarine? _____ feet per hour

What depth did the submarine start at? _____ feet

Write an equation to model this situation (use d for depth in meters and h for hours).

_____

30. You are in a submarine and are at a depth of 47 feet below sea level. Your depth changes to 51 feet below sea level. Did you go up or down?

    A. __Up
    B. __Down

Answer Key to Study Guide for Test 0: "Foundations of Algebra Readiness Check" (MAT093 Skills)

1. $27\frac{1}{8}$
2. $31\frac{1}{2}$
3. $10\frac{11}{20}$
4. $19\frac{53}{90} \sim 1\frac{73}{90}$
5. 114
6. 7220
7. 26.15
8. 90.29
9. 2797.03
10. $\frac{16}{25}$
11. 1300
12. 182
13. 2.87
14. 132
15. 180.00 ~ 2,580.00
16. 1,868.25 ~ 28,368.25 ~ 1,576.75 ~ 28,076.75 ~ 291.50
17. $\frac{25}{78}$
18. $\frac{1}{21}$
19. $\frac{17}{84}$
20. $-\frac{13}{21}$
21. 119.2 ~ 19
22. $\frac{3}{5}$
23. 330
24. 77
25. 0.2625
26. 1379.07
27. 0.31
28. $\frac{59}{1000}$
29. 34 ~ 2000 ~ $d = 34 \cdot h - 2000$
30. B: Down

Study Guide for Test 1: "College Math Readiness Check" (MAT097 Skills)

Work through this study guide to help you prepare for the "College Math Readiness Check", or "Test 1". This content aligns with the MAT097 (Foundations of Algebra) course offered at BHCC. You will need to score an 84% or higher on the actual test to place into a non-STEM college math course (MAT171/172/174/181) -or- into MAT099 (Intermediate Algebra) -or- to move on to the next test ("College Algebra Readiness Check" for students needing MAT194).

1. Evaluate: $b^2 - 4ac$ where $a = 1$, $b = 5$ and $c = -2$

_____

2. Evaluate

$$\frac{2x^2 - 3y}{2y^2 - 3x} \quad \text{for } x = -2 \text{ and } y = -3$$

_____

Write the answer as a reduced fraction.

3.

Simplifying Algebraic Expressions
Simplify by using the distributive property and combining like terms.
$-7(8x + 2) =$ _____
$6(-2w^2 - 9w + 1) =$ _____
$-(4t^2 - 6t + 7) =$ _____
$\frac{5}{6}\left(\frac{1}{3}x + \frac{6}{7}\right) =$ _____

4. Simplify $a + 7(3 - c) + 3(a + 6) =$ _____

5. Solve $-8(x - 7) + 7 = -6(x - 2)$ for x

$x =$ _____

6. Solve the equation for x
$6(x + 2) + 2 = -8(x - 1) - 6$

$x =$ _____

7. Solve for x:

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

You can enter your answer as an improper fraction (like 13/4), but not as a mixed number.

_____

8. Complete the table for the equation $y = -x - 4$. Then use **two** of your points to create its graph.

x	y
-1	_____
0	_____
1	_____
2	_____
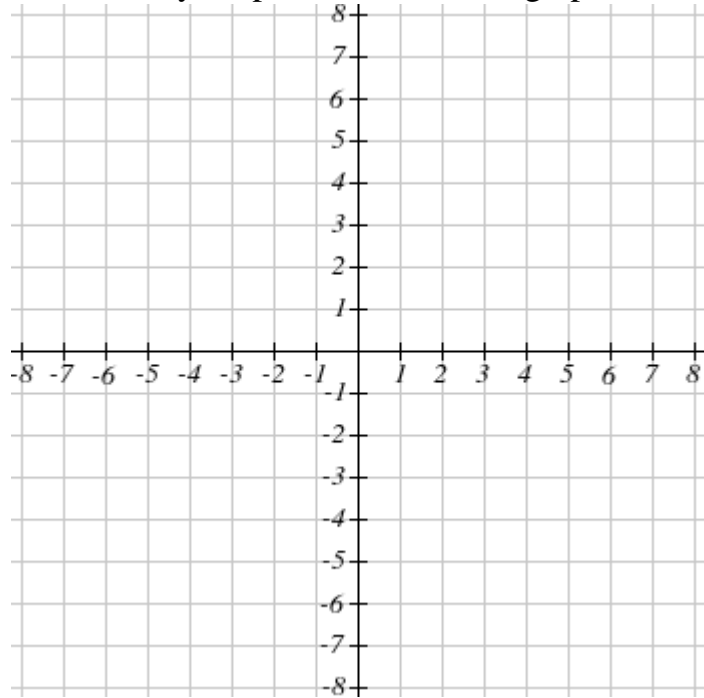
9.

Field Trip
The Aquarium charges $16 for adult admission and $9 for each child.   The Aquarium bill for a school field trip was $377.
Write a linear equation in general form to represent this situation. Let C represent the number of children and A represent the number of adults attending the field trip.   Equation: _____   If 33 children attended the field trip, how many adults were there?   There were _____ adults.

10. Find the x-intercept and y-intercept of the graph of $-4x - 2y = 8$. Then graph.

x-intercept = (_____,0)
y-intercept = (0,_____)
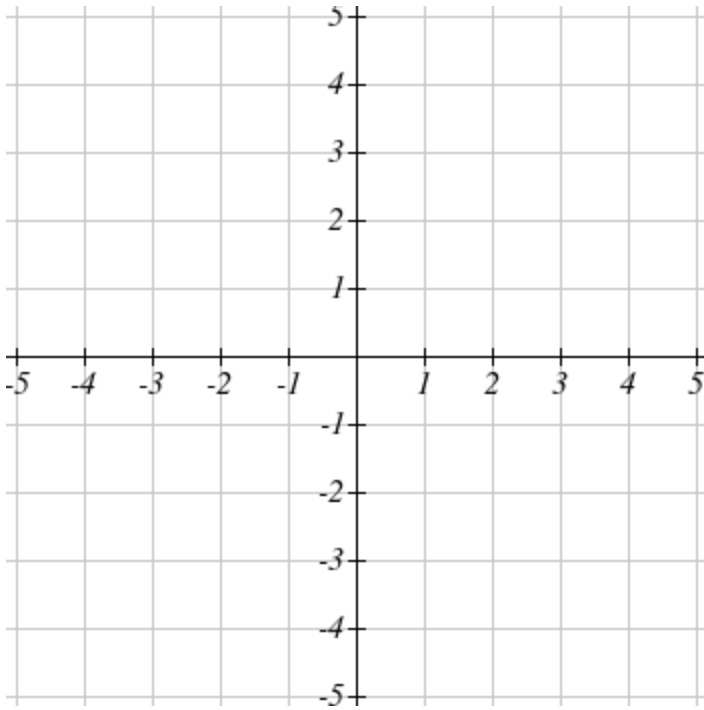
11. Use the slope-intercept form of a line $(y = mx + b)$ to graph the equation $y = -\frac{4}{5}x - 3$.

The slope is _____

The y-intercept is _____. (Remember to write the intercept as an ordered pair)
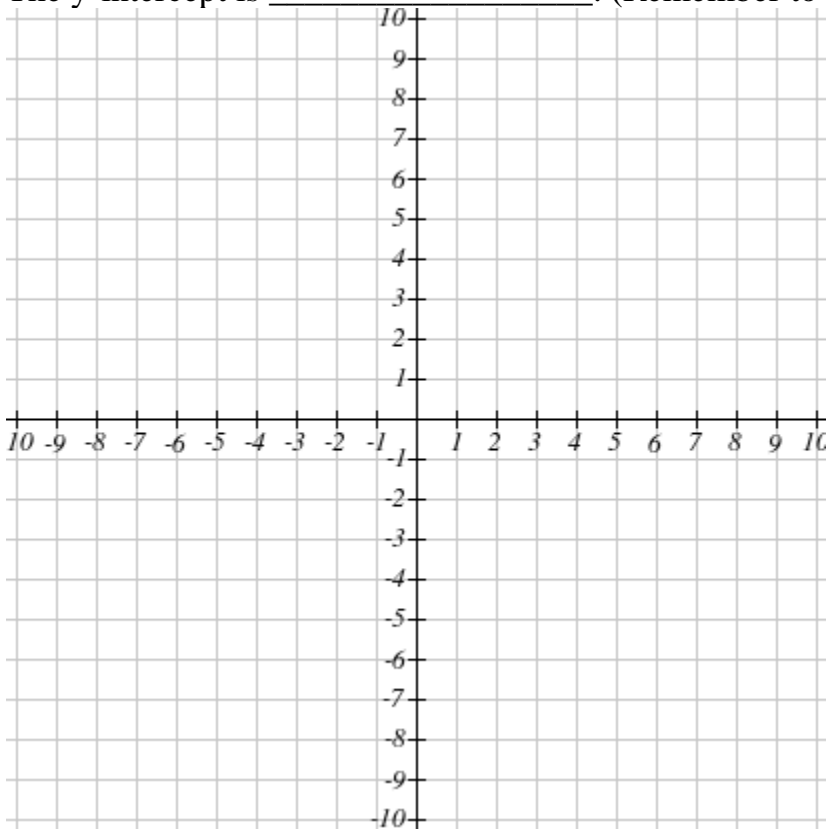
12. Consider the following equation: $-8x+7y=-7$

A) Write the above equation in the form $y=mx+b.$ Enter the values of m and b in the appropriate boxes below as integers or reduced fractions (in the form A/B.)

Answer: $y=$ _____ $x +$ _____

B) Use your answer in part (A) to find the ordered pair that lies on this line when $x=-21$.

Answer: $(-21,$ _____ $)$

Enter your answer as an integer or a reduced fraction in the form A/B.

13.

Graphing Inequalities

Graph the following inequality.

Note: To graph the inequality:

1. *Select the type of line below (solid or dashed).*
2. *Plot two points on the line.*
3. *Click on the side that should be shaded.*

$$y \leq -4x-2$$

14.

Graphing Inequalities
Graph the following inequality. Be sure to use a solid/dashed line as appropriate and to shade the appropriate region of the coordinate plane.

$$2x - y > 7$$
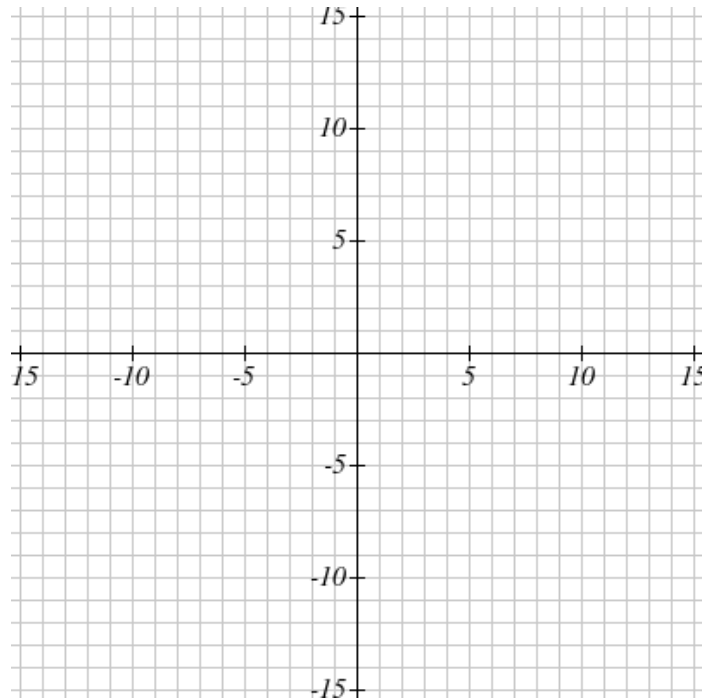
15.

Graphing Inequalities
Graph the following inequality. Be sure to use a solid/dashed line as appropriate and to shade the appropriate region of the coordinate plane.

$$9x + 3y \leq 12$$
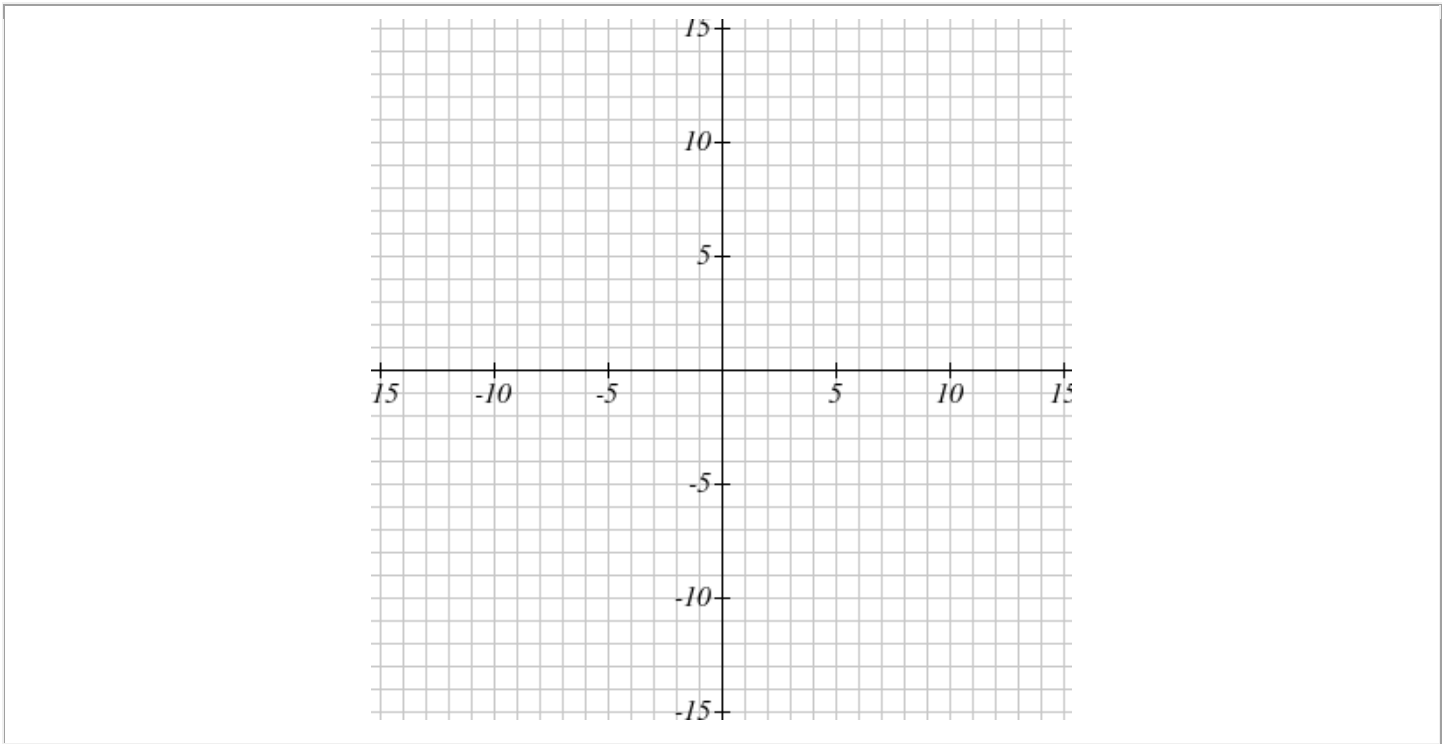
16. Solve the system of equations by graphing:

$$\begin{cases} y = 2x+7 \\ y = -2x-9 \end{cases}$$

First graph each line, then place a dot indicating the solution to the system.
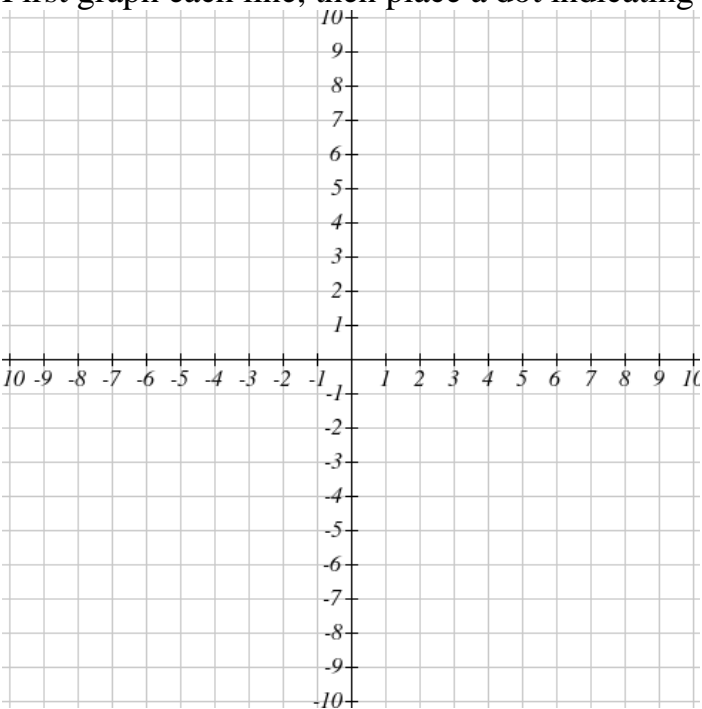
17. Solve the system of equations by graphing:

$$\begin{cases} 2y+x=4 \\ y+3x=-3 \end{cases}$$

First graph each line, then place a dot indicating the solution to the system.
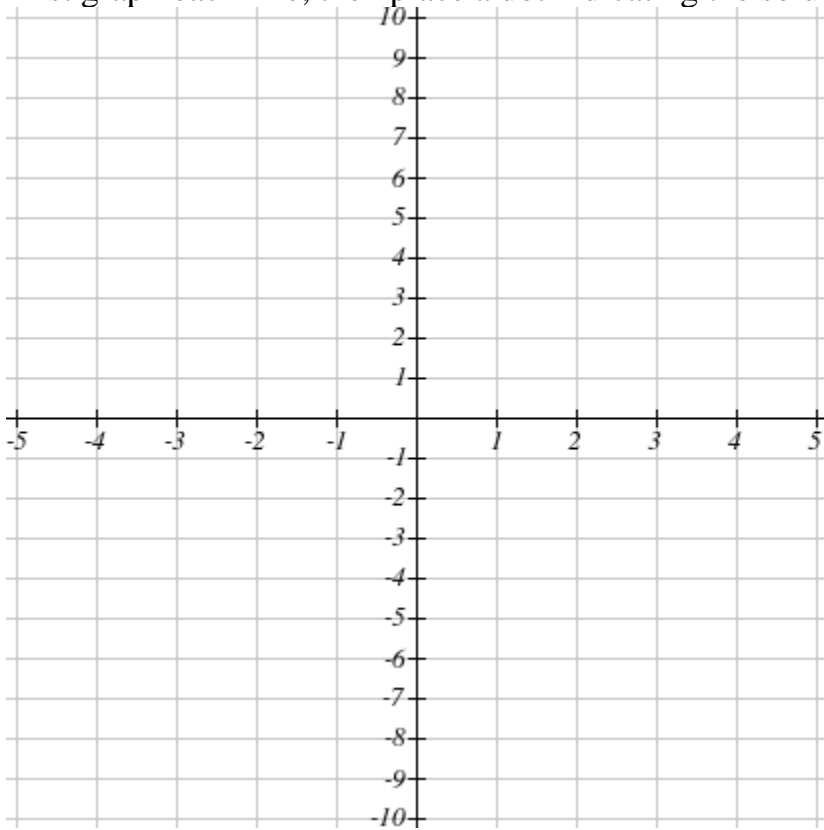
18. Solve the system by substitution:

$$\begin{cases} -5x-y = 3 \\ -4x-3y = 4 \end{cases}$$

Answer: (_____ ,_____)

Enter your answers as integers or as reduced fraction(s) in the form A/B.

19. Solve the system by elimination.

$$\begin{cases} -3x+y = 7 \\ 2x+2y = -2 \end{cases}$$

$(x,y) = ($_____,_____$)$

13

20. Solve the system by elimination.

$$\begin{cases} 4x-2y = 12 \\ -3x+3y = -15 \end{cases}$$

$(x,y) = ($ _____ , _____ $)$

21. Solve the system of equations. Give your solution as an ordered pair.

$8x-2y=10$

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

_____

22. Evaluate:

-|17| = _____   -|-17| = _____

|-(-17)| = _____

23. Find the absolute value of 7. _____

　　Find the opposite of 7. _____

　　Find the reciprocal of 7. _____

24. Rewrite this number in appropriate scientific notation:

74,400,000

answer = _____

25. Simplify: $\dfrac{9x^8y^9}{3x^4y^3}$

_____

26. Simplify the following expression completely: $\left(v^8\right)^{10}$

Answer: _____

27. Simplify the following expression completely: $\left(5y^4\right)^4$

Answer: _____

28. Simplify the following expression completely: $(4x^9)(7x^6)(8x^7)$

Answer: _____

29. Graph the equation $y = 4$ by completing a table of values.

30.

(7,-4)

(7,-9)
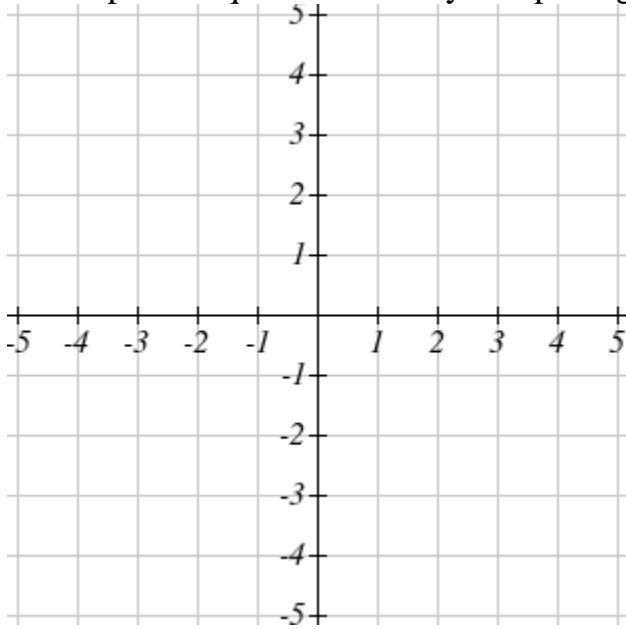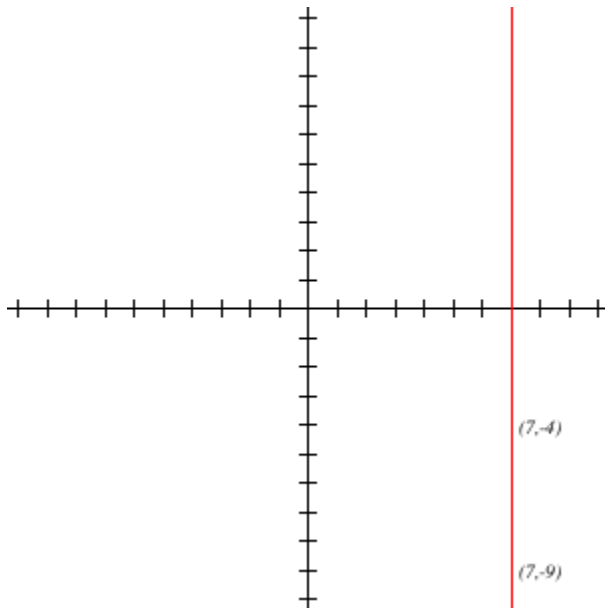
Find the equation of the line above.

_____

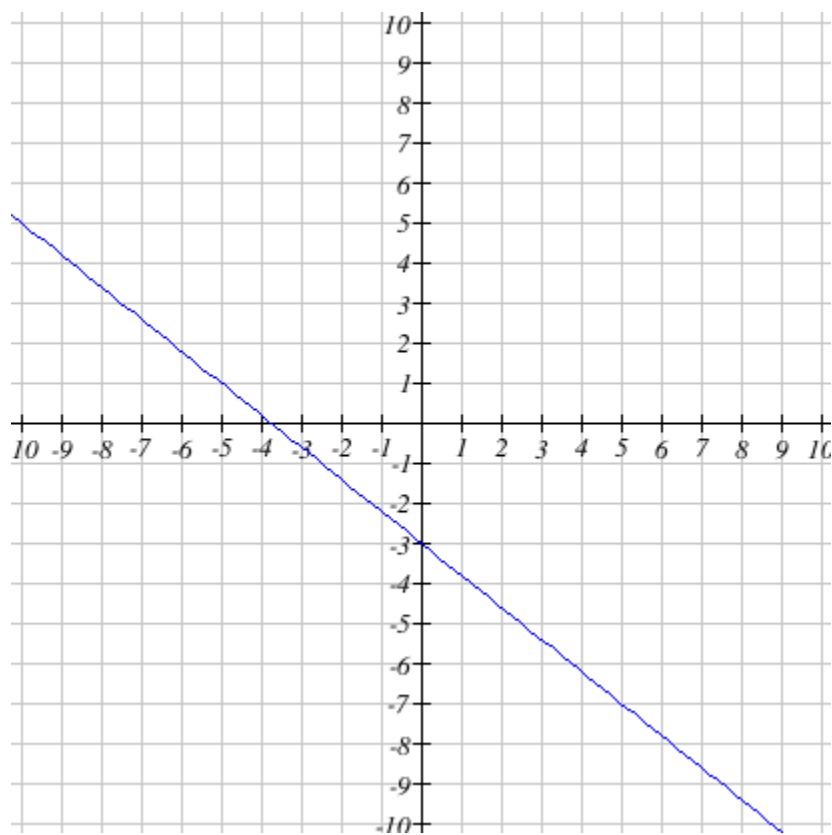**Answer Key** to Study Guide for Test 1: "College Math Readiness Check" (MAT097 Skills)

1. 33

2. $\frac{17}{24}$

3. $-56x-14$ ~ $-12w^2-54w+6$ ~ $-4t^2+6t-7$ ~ $\frac{5}{18}x+\frac{5}{7}$

4. $4a-7c+39$

5. $\frac{51}{2}$ or 25.5

6. $-\frac{6}{7}$

7. $-\frac{14}{3}$

8. -3 ~ -4 ~ -5 ~ -6 ~
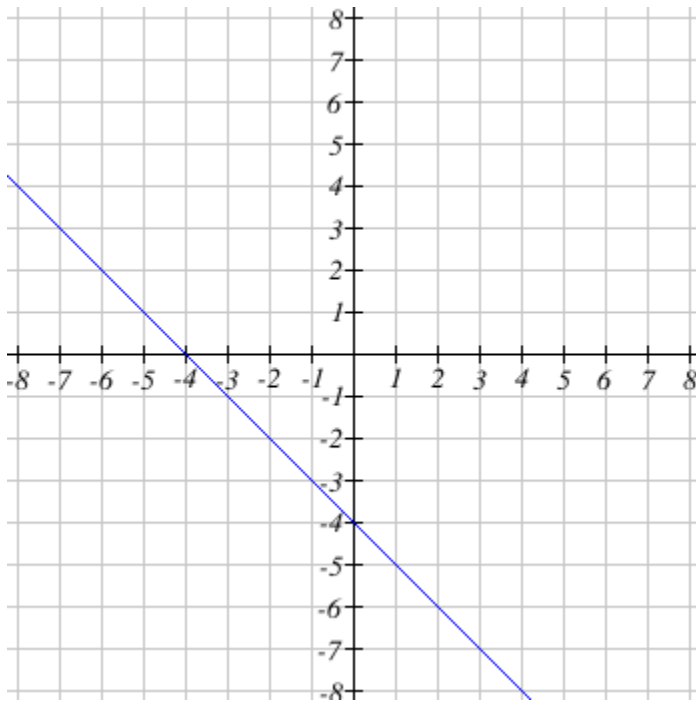
9. $9C+16A=377$ ~ 5

10. -2 ~ -4 ~

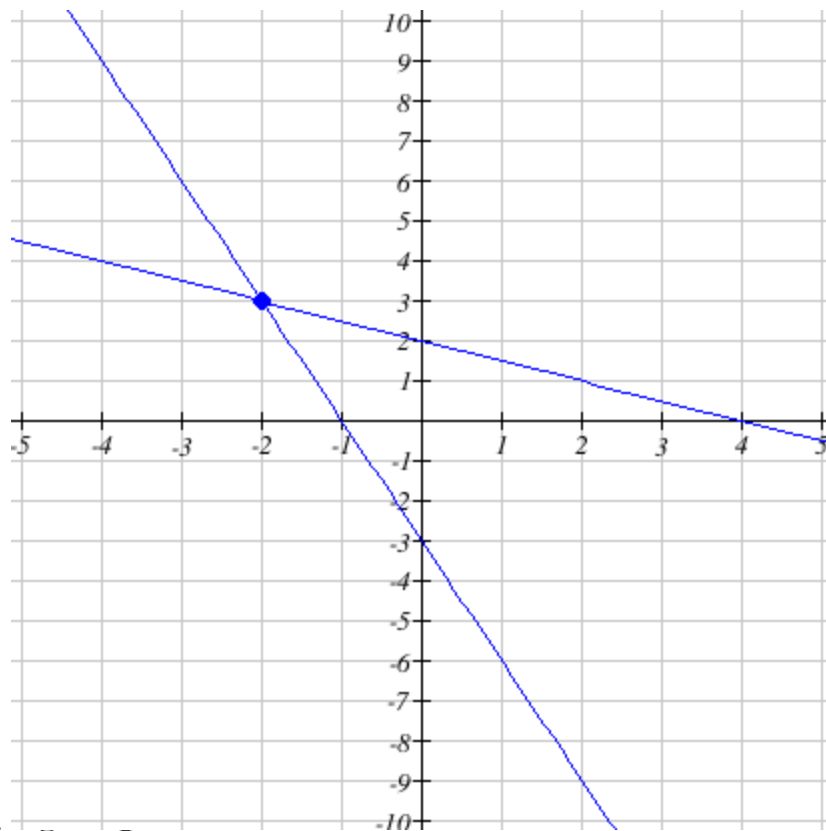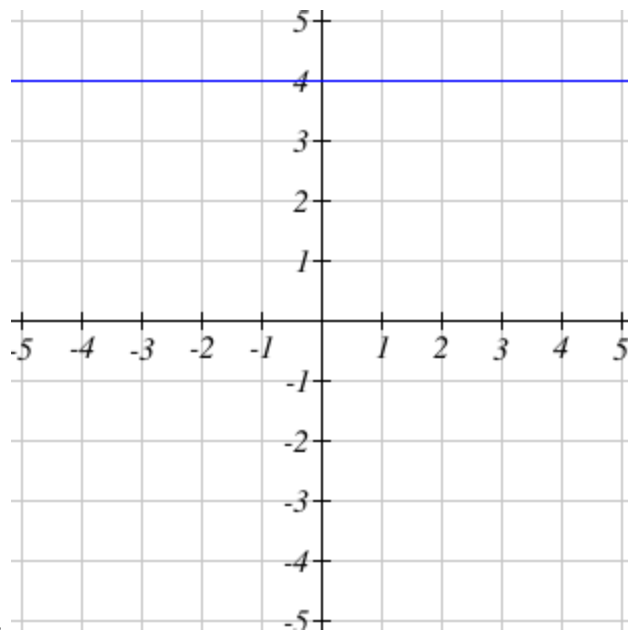11. $-\frac{4}{5}$ ~ $(0,-3)$ ~

12. $\frac{8}{7}$ ~ -1 ~ -25

13.

14.

18
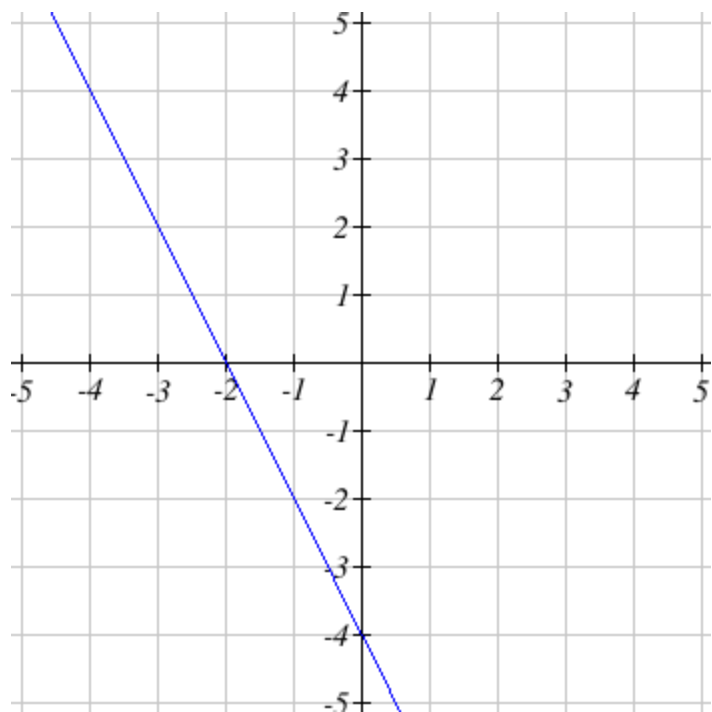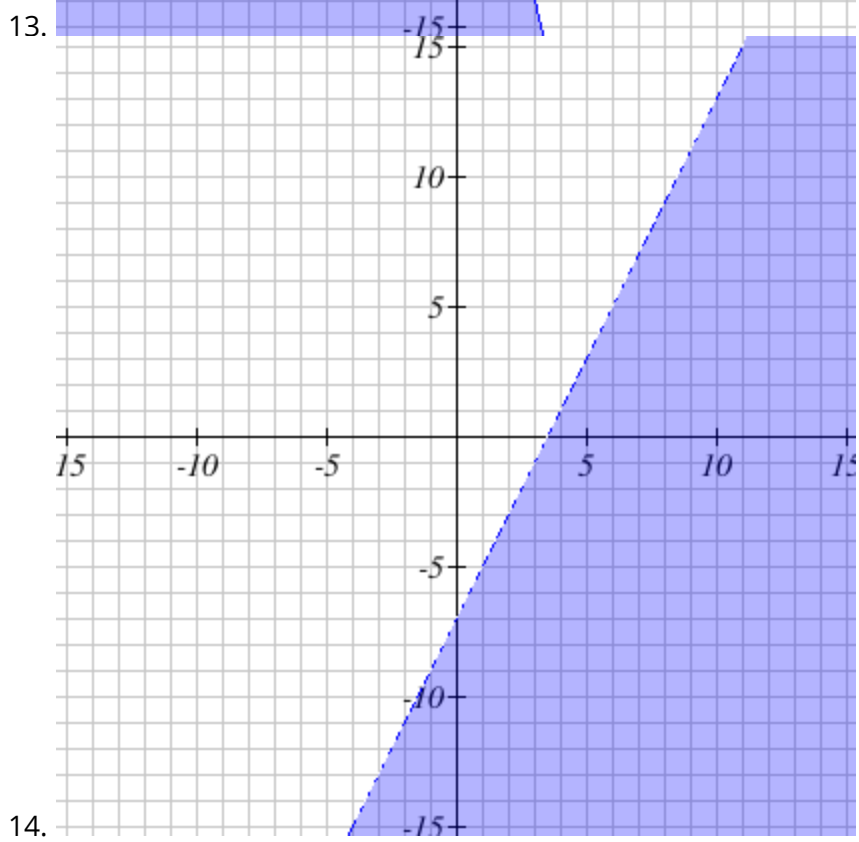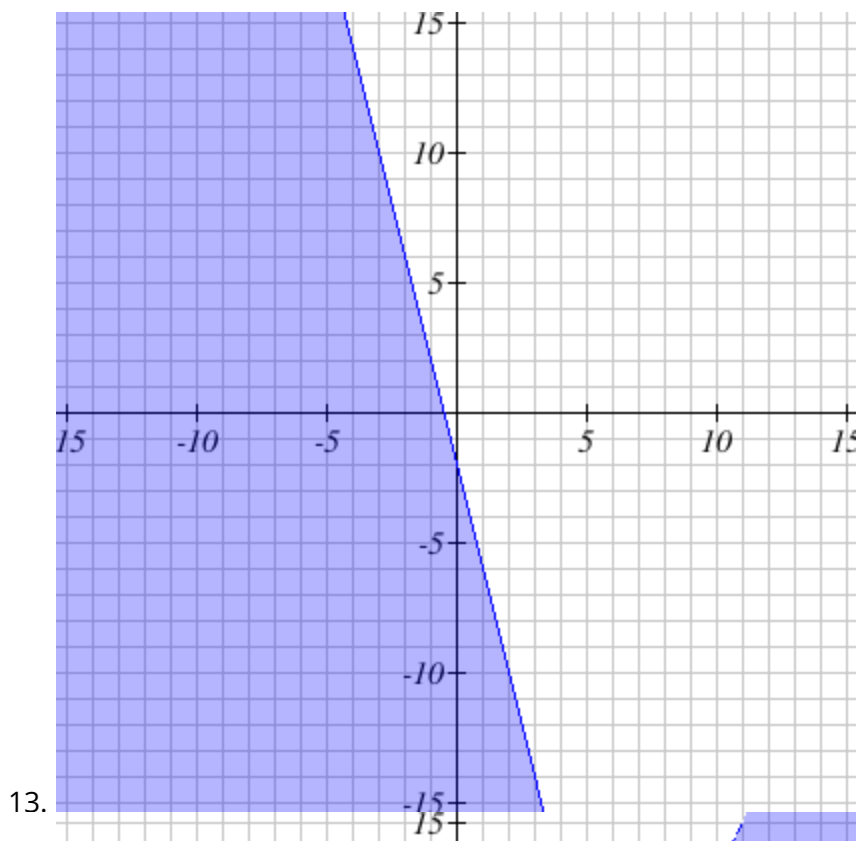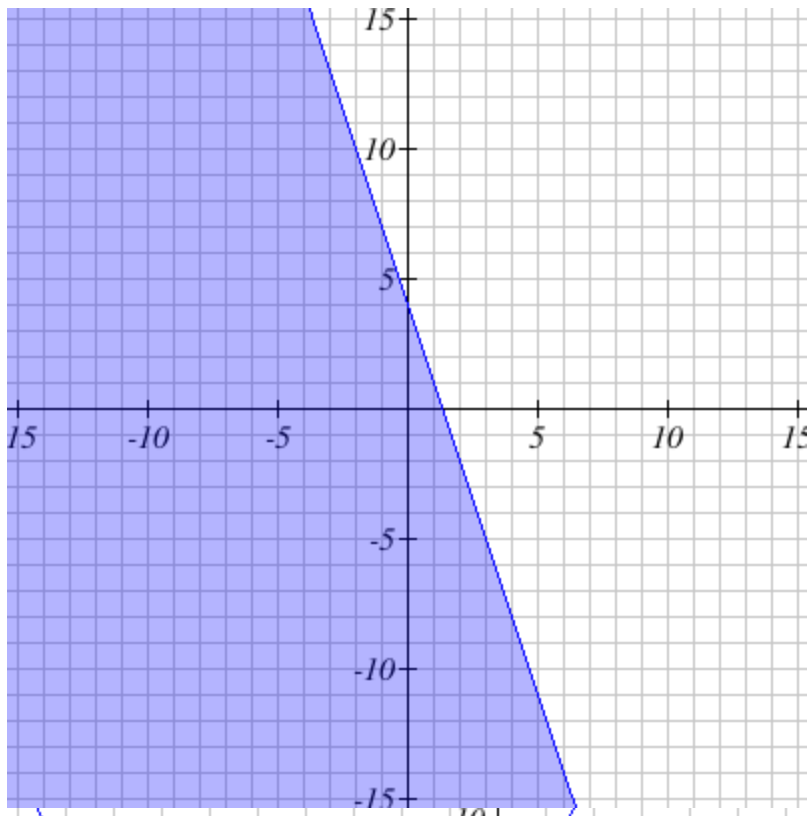
15.
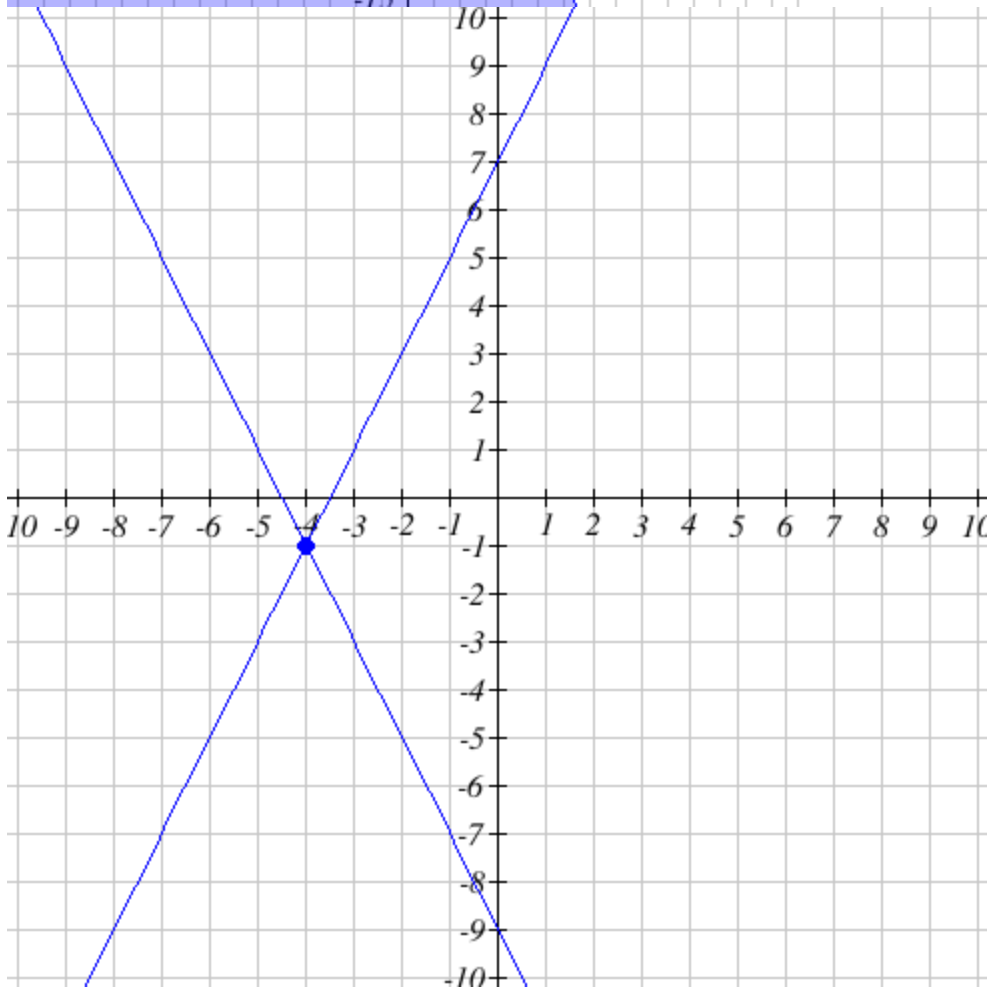
16.

17.

18. $-\frac{5}{11} \sim -\frac{8}{11}$

19. -2 ~ 1

20. 1 ~ -4

21. $(2,3)$

22. -17 ~ -17 ~ 17

23. 7 ~ -7 ~ $\frac{1}{7}$

24. $7.44 \cdot 10^7$

25. $3 \cdot x^4 \cdot y^6$

26. v^{80}

27. $625 \cdot y^{16}$

28. $224 \cdot x^{22}$

29.

30. $x = 7$

Study Guide for "College Algebra Readiness Check" (MAT099 Skills)

Work through this study guide to help you prepare for the "College Algebra Readiness Check", or "Test 2". This content aligns with the MAT099 (Intermediate Algebra) course offered at BHCC. You will need to score an 84% or higher on the actual test in order to enroll in MAT194 (College Algebra). **Only students who need to take MAT194 need to take this test**

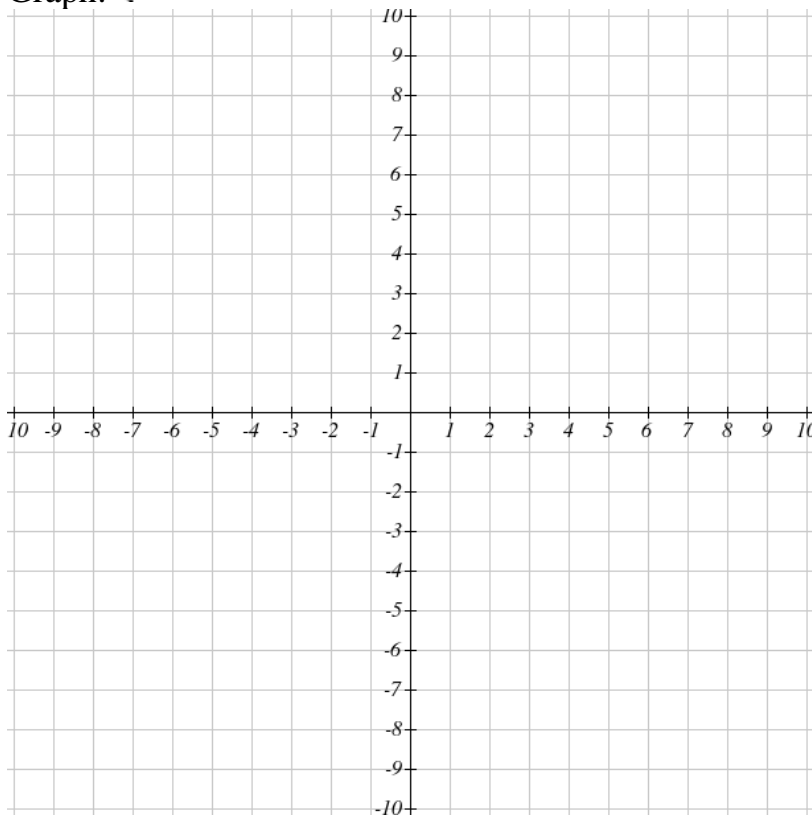1. Graph the inequality and give interval notation for the solution.

$-6x-7>11$ OR $-8x+9\leq-23$
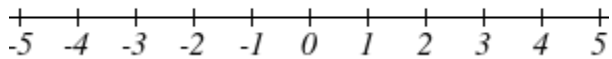
Interval notation for the above inequality and graph is _____

2.

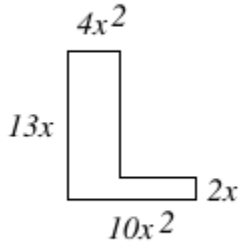Graph: $\begin{cases} y<4x+2 \\ y>-x-1 \end{cases}$

3. Simplify $\dfrac{x^5\cdot\left(y^{-4}\cdot z^{-5}\right)^3}{x^{-8}\cdot y^{-3}\cdot z^2}$

Write your answer with positive exponents only.

_____

4. Write the polynomial that represents the perimeter of the figure pictured below.

$4x^2$

$13x$

$2x$

$10x^2$

Perimeter = _____

5. Multiply and simplify: $(-8x+9)(4x^2+5x-6) =$ _____

6. Solve $3m^3+6m^2-24m=0$

_____

7. Solve by completing the square. Enter **exact values.**

$x^2-8x+13=0$

If you have two solutions, list them separated by commas.
For example: for $2-\sqrt{5}$ and $2+\sqrt{5}$, type "2-sqrt(5),2+sqrt(5)"
If there is no solution, write "DNE" (does not exist)

_____

8. Which of the expressions below is equal to the expression $\sqrt{36x^6y^7}$ when written using a rational exponent?
rational exponent?

A. ___ $6x^3y^3\sqrt{y}$

B. ___ $(36x^6y^7)^{\frac{1}{2}}$

C. ___ $(36x^6y^7)$

D. ___ $36(x^6y^7)^{\frac{1}{2}}$

9. Simplify: $(3x^4y^0)(2x^0)$

_____

10.

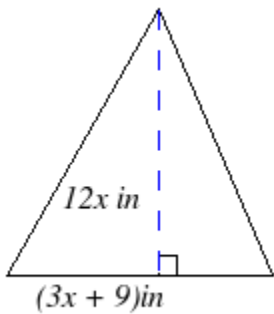Graph: $\begin{cases} y > x-1 \\ y < -\frac{1}{2}x-2 \end{cases}$
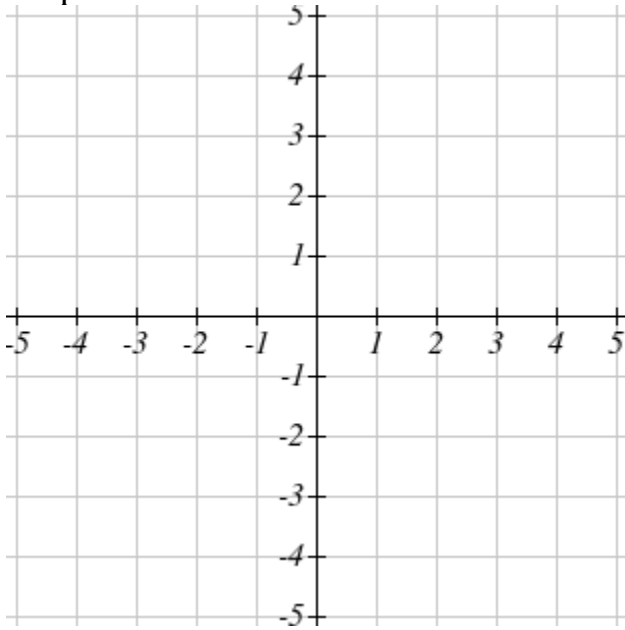
11. Simplify completely. Do not use any parentheses in your answer.

$$\left(\frac{d^2}{t^5}\right)^{-2}$$

_____

12. Add the polynomials:

$$\left(-11x^5-9x^3+x^2+4\right)+\left(11x^5-3x^4-9x^2+12\right)$$

_____

13. Find the area of the triangle. Simplify your answer.

12x in

(3x + 9)in

The area is _____ square inches.

14. Solve the following equation:

$$(9a+11)(a+9)=79$$

$a = $ _____

15. Solve the equation given by completing the square. If there are more than one answers, separate them by a comma. If there is no solution, enter DNE (short for does not exist.)

$$-3x^2+18x-24=0$$

$x = $_____

16. Simplify: $\dfrac{(a^{2/3}b^{1/5})^{3/4}}{a^{9/10}}$

_____

17. Solve $4-4\sqrt{x-3}=-20$ for x

_____

18. Solve for x:

$$\sqrt{7x+2}=x+2$$

$x = $_____

19. Add and simplify: $\dfrac{x^2+x}{x^2+30x+125}-\dfrac{1}{x+5}$

_____

20. Simplify $\dfrac{12x}{x^2-8x+16}+\dfrac{10}{x-4}$ and give the domain.

$x \neq$ _____

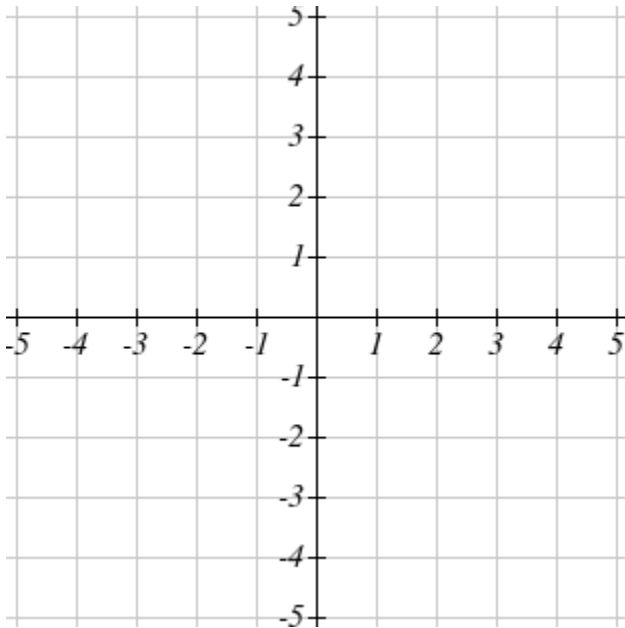State the sum in simplest form.

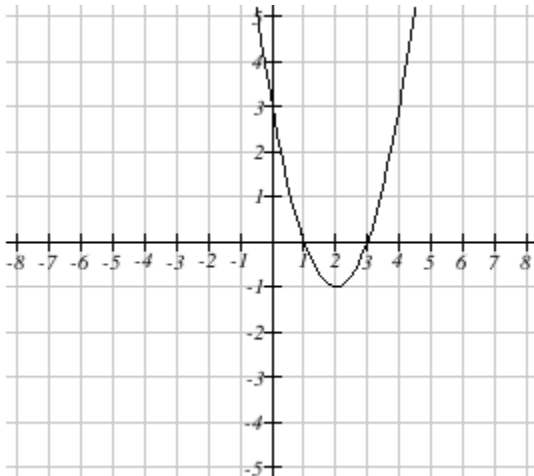$$\dfrac{12x}{x^2-8x+16}+\dfrac{10}{x-4}=$$ _____

21. What is the family of the equation $y = 4x^2 - 3$?

    A. __exponential
    B. __linear
    C. __quadratic

Create a table of values for the equation on paper and use it to help you graph the equation.

22. You are working with a quadratic equation and construct the following graph.

Identify the vertex of the parabola: _____
Remember that the vertex is a point!

Identify the y-intercept of the parabola: _____
Remember that the y-intercept is a point!

Identify the x-intercepts: _____ and _____
Remember that the x-intercepts represent points on the graph!

Given the x-intercepts above, write an equation for the parabola in factored form:
$y =$ _____
Hint: Think about the zero-product property.

Write an equation for the axis of symmetry: _____

23. An object is thrown upward at a speed of 110 feet per second by a machine from a height of 8 feet off the ground. The height h of the object after t seconds can be found using the equation $h = -16t^2 + 110t + 8$

When will the height be 182 feet?
_____ (choose the units for your answer: feet / Ft/sec / sec/ft / seconds)

When will the object reach the ground?
_____ (choose the units for your answer: feet / ft/sec / sec/ft / seconds)

24. The equation $D = \frac{1}{2}n(n-3)$ gives the number of diagonals D for a polygon with n sides. Find the number of sides for polygon that has 90 diagonals.

_____

25. Solve for x. If there is more than one solution, separate the solutions with a comma.

$\frac{6}{x-3} + \frac{x}{x-1} = \frac{-1x+15}{x^2-4x+3}$

_____

26. For the following rational equation $\frac{6}{x+3} - \frac{3}{x-2} = \frac{2}{x^2+x-6}$, first state the restriction(s):

$x \neq$ _____

Next provide the solution(s) as a single fraction in lowest terms. If there is no solution, type "DNE".

$x =$ _____

27. Solve for x

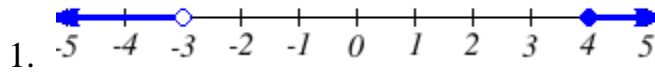$$\frac{1}{x^2-4x}+\frac{x}{x-4}=\frac{2}{x^2-4x}$$

$x =$ _____

28. Wilma can mow a lawn in 60 minutes. Vanessa can mow the same lawn in 40 minutes. How long does it take for both Wilma and Vanessa to mow the lawn if they are working together?
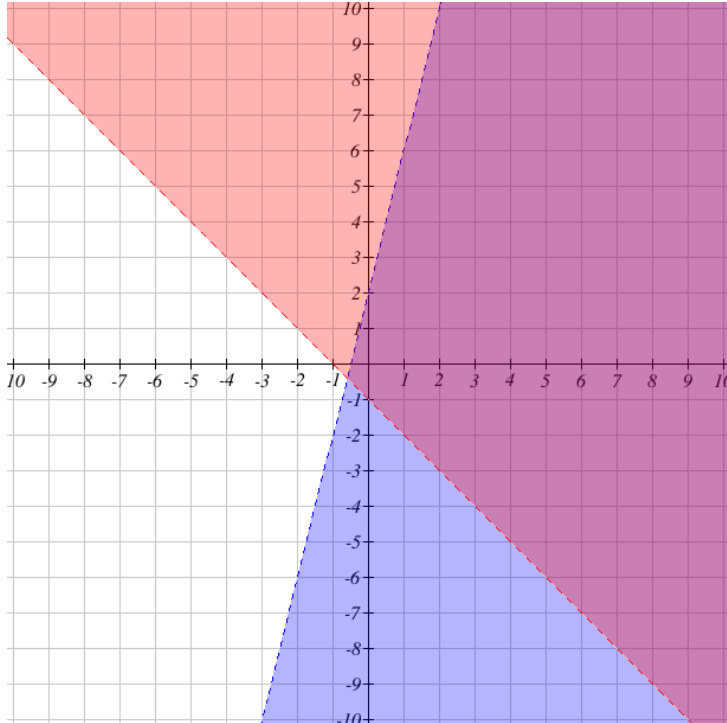_____ minutes

29. Simplify: $\dfrac{5-\frac{6}{x+4}}{\frac{9x}{x+4}-8}$

_____

30. (Simplify the expression $\dfrac{\frac{1}{x}-\frac{1}{7}}{\frac{1}{x^2}-\frac{1}{49}}$

_____

Answer Key for "College Algebra Readiness Check" (MAT099 Skills)

1.

   ~ (-oo,-3)U[4,oo)
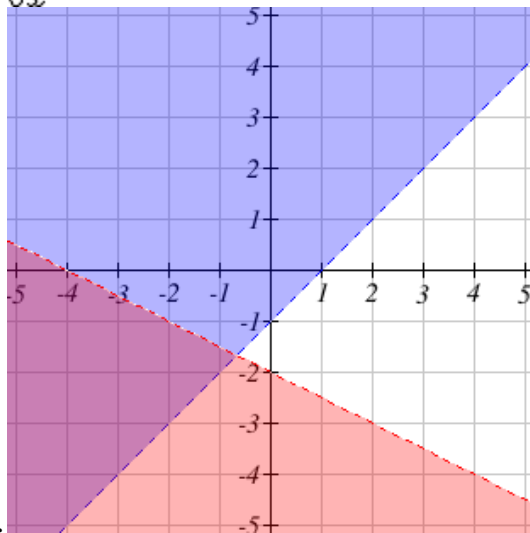
2.

3. $\dfrac{x^{13}}{y^9 z^{17}}$

4. $20x^2+26x$

5. $-32x^3-4x^2+93x-54$

6. $0,2,-4$

7. $4+\sqrt{3}, 4-\sqrt{3}$

8. B: $\left(36x^6 y^7\right)^{\frac{1}{2}}$

9. $6x^4$

10.

11. $\dfrac{t^{10}}{d^4}$

12. $-3x^4-9x^3-8x^2+16$

13. $18x^2+54x$

14. $-\dfrac{2}{9},-10$
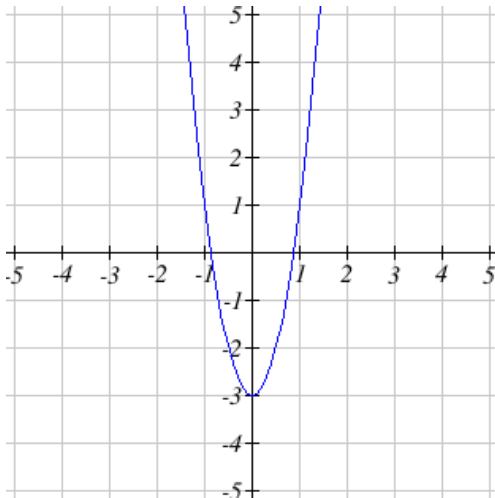
15. $4,2$

16. $\dfrac{b^{\frac{3}{20}}}{a^{\frac{2}{5}}}$

17. 39

18. $2,1$

19. $\dfrac{x-5}{x+25}$

20. $4 \sim \dfrac{22x-40}{(x-4)^2}$

21. C: quadratic ~

22. $(2,-1) \sim (0,3) \sim (1,0) \sim (3,0) \sim (x-1)(x-3) \sim x=2$

23. $2.47, 4.41 \sim$ seconds $\sim 6.95 \sim$ seconds

24. 15

25. -7

26. $-3,2 \sim \dfrac{23}{3}$

27. $1,-1$

28. 24

29. $\dfrac{5x+14}{1x-32}$

30. $\dfrac{7x}{7+x}$