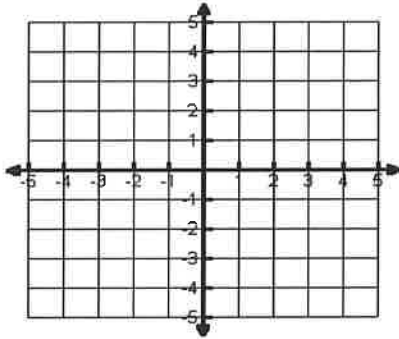


**SHOW ALL WORK! (3 pts each )**

1. Find the inverse of $f(x) = \frac{2}{3}x - 5$	2. If $f(x) = 3x - 2$ and $g(x) = 4x^2 - 3$ , find $f(g(-2))$
3. If $f(x) = 4x - 2$ and $g(x) = 3x^2 - 1$ , find $f(x) * g(x)$	4. If $f(x) = x - 1$ and $g(x) = 3x^2 + 2$ , find $g(f(x))$
5. What are the transformations used to obtain the graph of $y =  x + 2  - 3$ from the parent function $y =  x $ .	6. <b>Set up a system of equations and solve.</b> The perimeter of a rectangle is 94 cm. The length of the rectangle is one less than three times the width. Find the dimensions.
7. <b>Set up a system of equations and solve.</b> Kate has 45 coins in his piggy bank. If the coins are all quarters and dimes and their total is \$8.70, how many of each does she have?	8. <b>Write a piecewise function.</b> A T-shirt printing company is going to charge HHS \$10 per shirt for the first 75 graduation t-shirts. If the school buys more than 75, the company reduces the price to \$8 per shirt. Express $y$ , the total cost in dollars, as a piecewise function of $x$ , the number of shirts ordered.

9. Graph the system of inequalities.

$$\begin{aligned} 3x - 2y &< 6 \\ x + 2y &< 8 \end{aligned}$$

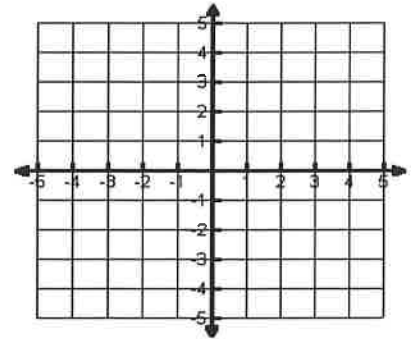


10. Graph  $y = -|x + 1| + 5$

Vertex \_\_\_\_\_

Domain \_\_\_\_\_

Range \_\_\_\_\_



11. Solve and graph the solution on a number line

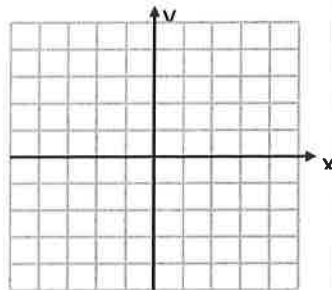
$$\frac{2}{3}|x - 1| + 2 < 6$$

12. Solve and graph the solution on a number line

$$-2|x + 3| + 2 < -10$$

13. Graph the following piece-wise function. State domain and range.

$$f(x) = \begin{cases} x+2 & \text{if } x < -2 \\ |x+1| & \text{if } -2 \leq x < 0 \\ 1 & \text{if } 0 \leq x \leq 4 \end{cases}$$



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

14. Solve by SUBSTITUTION!

$$\begin{cases} x - 9y = 25 \\ 6x - 5y = 3 \end{cases}$$

## Math 3 Unit 1: Functions and Their Inverses

### Multiple Choice:

---

1) What is the equation for the **inverse** of the function  $y = 4x - 5$  ?

- (A)  $y = 4x + 5$       (B)  $y = -4x + 5$   
(C)  $y = \frac{1}{4}x - \frac{5}{4}$       (D)  $y = \frac{1}{4}x + \frac{5}{4}$
- 

2) If  $f(x) = -3x + 1$  and  $g(x) = 2x^2$ , which is the function  $(f \circ g)(x)$  ?

- (A)  $(-3x+1)(2x^2)$       (B)  $-6x^2 + 1$   
(C)  $2(-3x+1)^2$       (D)  $-2(1-3x)^2$
- 

3) If  $(f \circ g)(x) = 2x - 1$ , how might  $f(x)$  and  $g(x)$  be defined?

- (A)  $f(x) = x - 1$  and  $g(x) = 2x - 1$   
(B)  $f(x) = x - 1$  and  $g(x) = 2x + 1$   
(C)  $f(x) = 2x - 1$  and  $g(x) = x - 1$   
(D)  $f(x) = 2x + 1$  and  $g(x) = x - 1$
- 

4) Given the system  $\begin{matrix} 4x - 3y = 8 \\ 8x - 6y = 16 \end{matrix}$  Which statement is true?

- A. The solution is (2, 0).      B. There is NO solution.      C. There are infinitely many solutions.
- 

5) Pick which ordered pair is a solution of the system of linear equations.

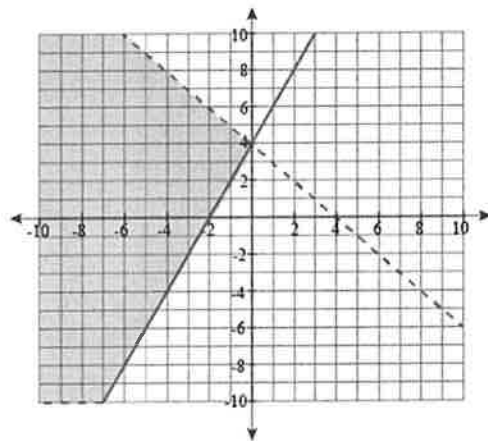
$$\begin{matrix} 3x - 2y = 11 \\ -x + 6y = 7 \end{matrix}$$

- A. (7, 5)      B. (1, -4)      C. (11, 3)      D. (5, 2)
- 

6) For  $f(x) = 5x + 1$ , find  $f(-4)$

- A. -19      B. 1      C. -21      D. 21
- 

7) From looking at the graph below, what is a solution to the system?



- A. (-2, 6)  
B. (-5, 7)  
C. (2, 2)  
D. (0, 5)
-

8) Which constant could you multiply one of the equations in this system by to solve by

elimination easily?  $3x + 5y = 7$   
 $-2x + y = 8$

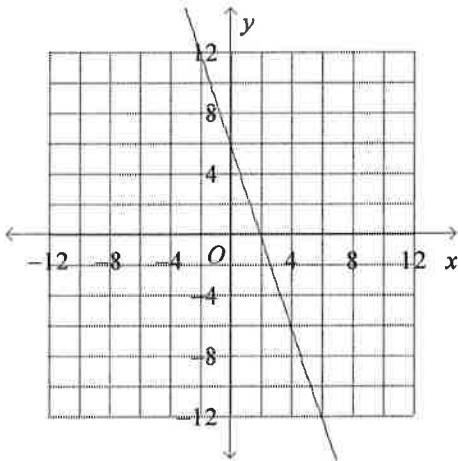
- A. 3      B. -5      C. -1      D. 2

9) Which point satisfies the system  $y = x + 3$  and  $y = 5 - x^2$ ?

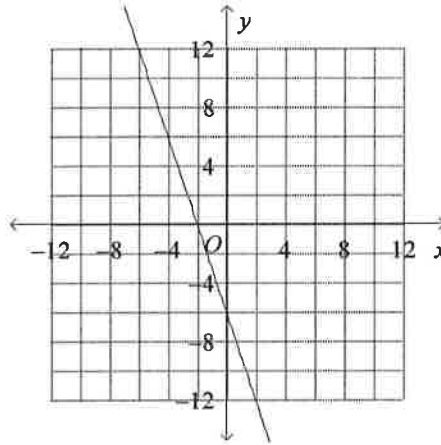
- A. (4, -1)      B. (-1, 2)      C. (2, 1)      D. (-2, 1)

10) Graph the equation  $-3x - y = 6$

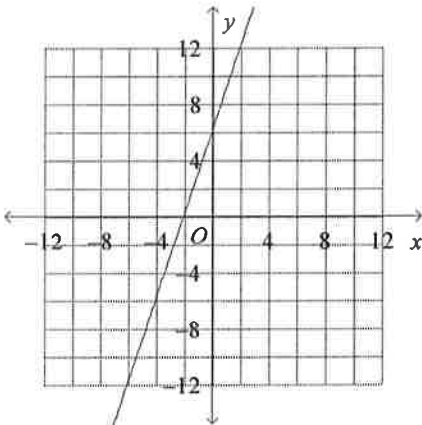
A.



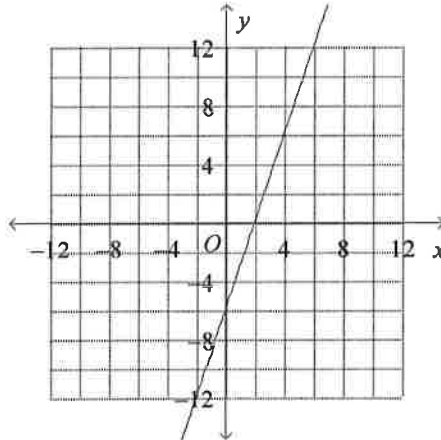
B.



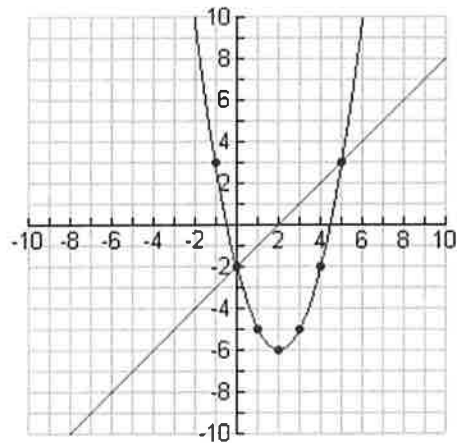
C.



D.



11) From looking at the graph below, what is (are) the solution(s) to the system?



A. (5,3)

B. (2,-6)

C. (5,3) and (-1,3)

D. (5,3) and (0,-2)

12) The equations  $5x + 2y = 48$  and  $3x + 2y = 32$  represent the money collected from school concert

ticket sales during two class periods. If  $x$  represents the cost for each adult ticket and  $y$  represents the cost for each student ticket, what is the cost for each adult ticket?

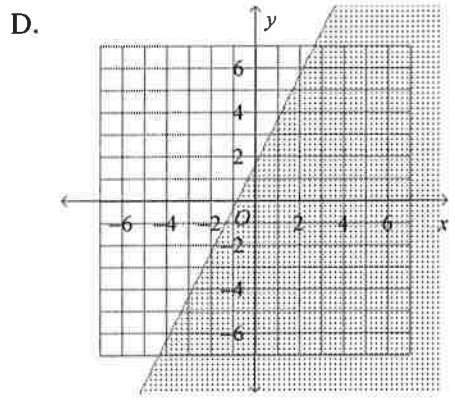
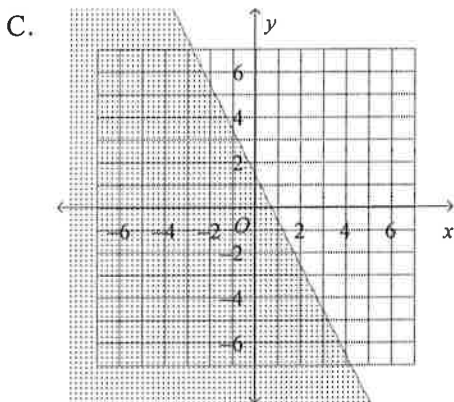
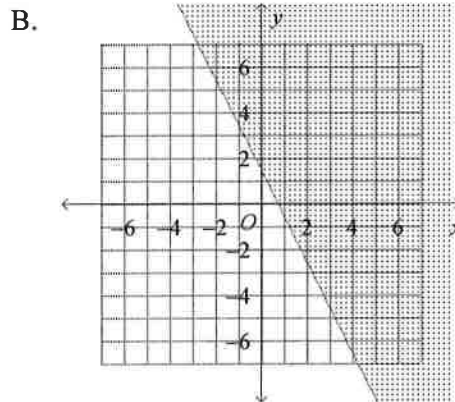
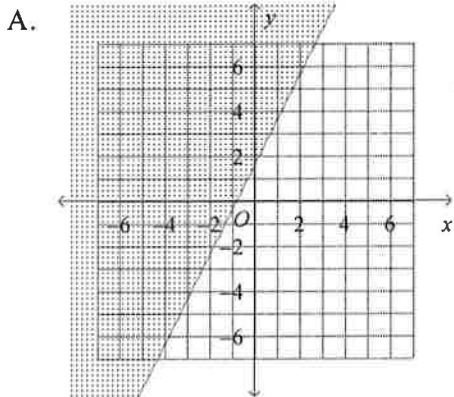
A. 4

B. 8

C. 20

D. 10

13. Graph the inequality  $4x - 2y < -3$ .



---

14) Evaluate the piecewise function for the given value of the domain.  $f(x) = \begin{cases} 3x+1 & \text{if } x < -1 \\ -2x+5 & \text{if } x \geq -1 \end{cases}$

Find  $f(2)$ .

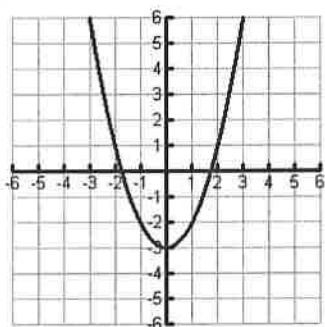
- A. -9                      B. -8                      C. 1                      D. 7
- 

15) Which set of points is in the solution set for the system of inequalities:  $x - y > 1$  and  $y < 2x - 1$ ?

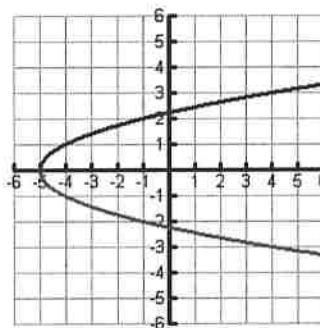
- A. (-1, -1)                      B. (-2, -1)                      C. (0, 1)                      D. (0, -2)

16) Determine which of the following relations are functions. Circle your answer.

a)



b)



Is it a function? (circle one):

Yes                      No

Is it a function? (circle one):

Yes                      No

---

17) From 1840 to 1990 the percent of the labor force in farming and non-farming occupations can be

modeled by the equations  $y = -0.48t + 67.2$  where  $t = 0$  represents 1840. In what year was the labor

force split equally into farming and non-farming occupations?

Round your answer to the nearest year.

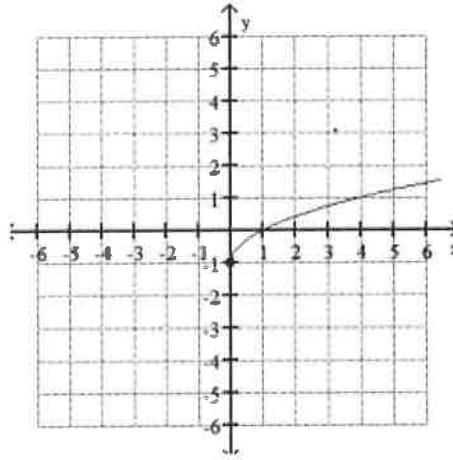
- A. 1876                      B. 1890                      C. 1976                      D. never
- 

18) Which of the following best describes the transformations used to obtain the graph of  $y = -|x+1| - 3$

from the parent function  $y = |x|$ ?

- A. reflect across the  $x$ -axis, shift right one unit and down three units  
B. reflect across the  $x$ -axis, shift left one unit and down three units  
C. reflect across the  $y$ -axis, shift left one unit and up three units  
D. reflect across the  $y$ -axis, shift right one unit and down three units

19) Use the graph to determine the functions domain and range.



- A) Domain  $[0, \infty)$     Range  $(-\infty, \infty)$   
B) Domain  $(-\infty, \infty)$     Range  $[-1, \infty)$   
C) Domain  $[0, \infty)$     Range  $(-1, \infty)$   
D) Domain  $[0, \infty)$     Range  $[0, \infty)$

---

20. Solve  $|3x + 5| = 1$

a.  $x = 2$  or  $x = -1\frac{1}{3}$

c.  $x = 2$  or  $x = -2$

b.  $x = 2$  or  $x = -4$

d.  $x = -1\frac{1}{3}$  or  $x = -2$

---

**Free Response:**

1) Given: 
$$\begin{cases} f(x) = 2x + 1 \\ g(x) = 15x^2 \\ h(x) = 5 \\ b(x) = x^2 + 3x - 10 \\ c(x) = 4x \\ j(x) = 3\sqrt[3]{2x - 1} + 4 \end{cases}$$

Find each of the following

$f(7x)$	$h(-10)$	$(b + c)(x)$	$\left(\frac{g}{h}\right)(x)$	$f(g(x))$
$f^{-1}(x)$	$g(c(2))$	$b(x) - c(x)$	$g^{-1}(x)$	$j^{-1}(x)$

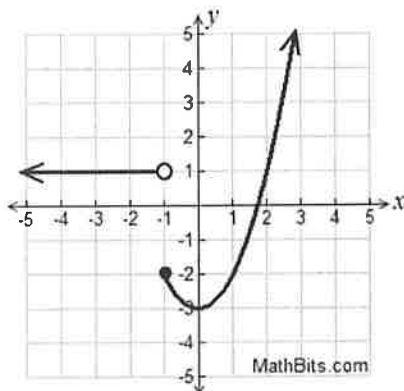
2) Given the linear equation  $5x + 2y = 10$ . Put into slope intercept form. Then find the slope and y-intercept.

Slope Intercept Form

Slope

Y-intercept

3) Use the following piecewise function graph to answer the questions below.



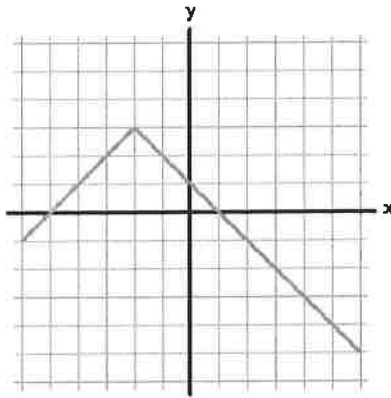
$f(1) =$

$f(-1) =$

$f(-2) =$



- 4) Given the graph of the function,  $g(x)$ , below, identify the domain, range, and how it is translated from  $f(x) = |x|$ .



Domain:

Range:

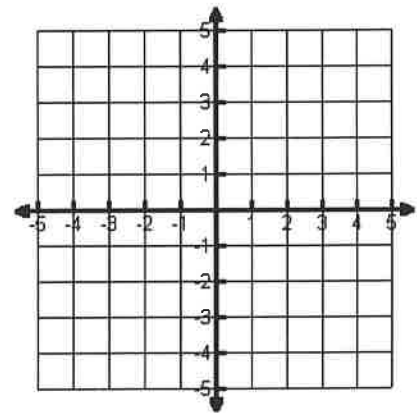
Translation from  $f(x)$ :

Equation of  $g(x)$ :

- 
5. Graph the following inequality:  $2x - 6y \leq 12$

State the slope: \_\_\_\_\_

State the y-intercept: \_\_\_\_\_



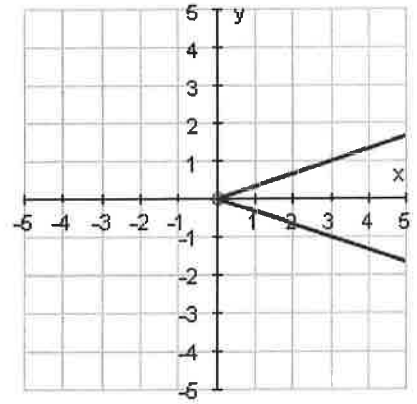
- 
6. **Solve using any method.** Jacob has 34 coins in his piggy bank. If the coins are all quarters and dimes and their total is \$6.55, how many quarters and dimes are in the bank?

A) Write two equations to represent this situation.

B) Solution:

7. Refer to the graph.

Is the given graph a function? How do you know?



Is the inverse of the given graph a function? How do you know?

Draw the graph of the inverse on the same axes.

---

8. The points  $(9, 13)$  and  $(-4, 10)$  are on  $p(x)$ . Name 2 points on  $p^{-1}(x)$ .

---

9. Is it always true that  $f(g(x)) = g(f(x))$ ? If yes, state why. If no, give an example where it's not true.

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10. Evaluate each of the following for function  $g$  (the graph shown). If you use the graph, no work needs to be shown. Else, show your calculation. If it is impossible to evaluate, explain why not.

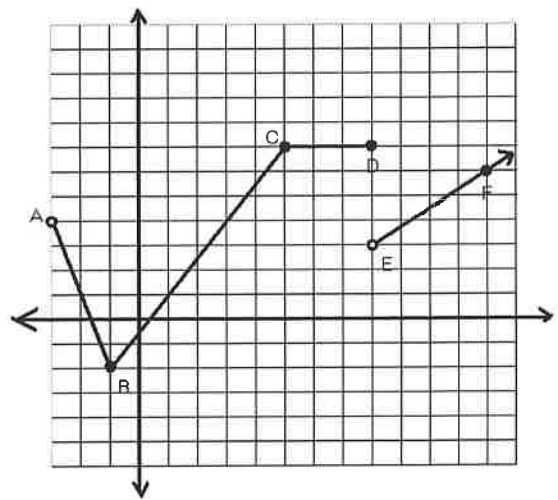
a.  $g(3)$

b.  $g(-1)$

c.  $g(-3)$

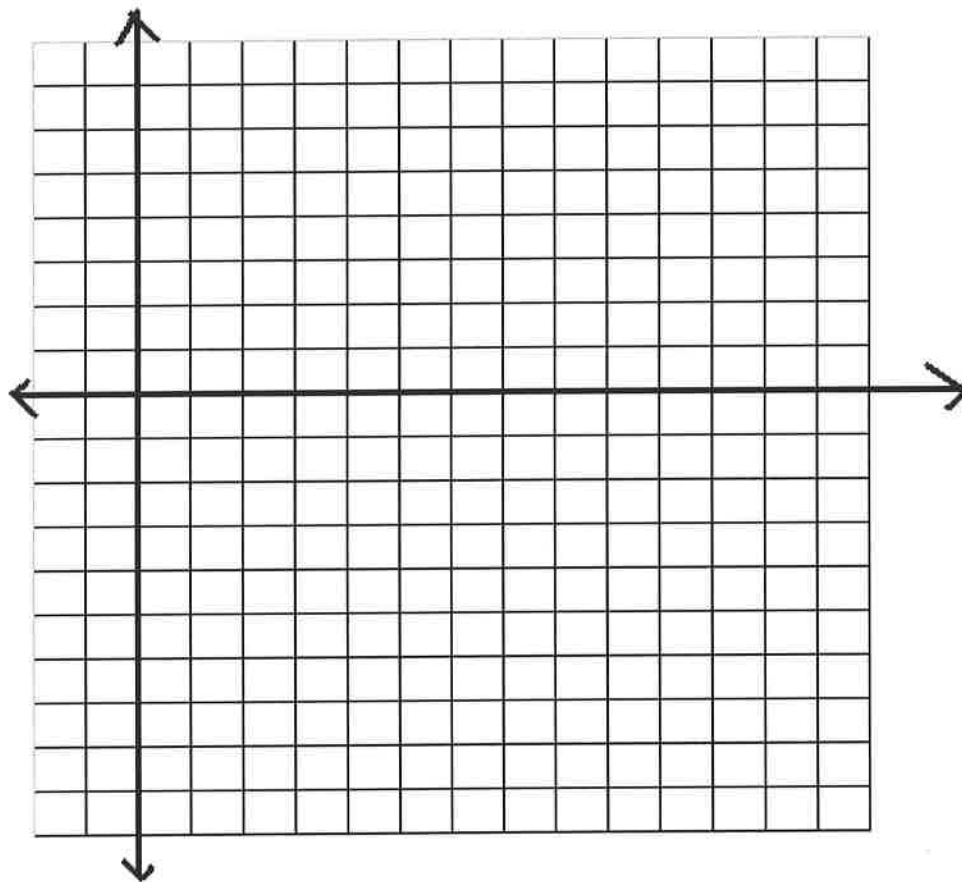
d.  $g(8)$

e.  $g(40)$



11. Graph the following piecewise function in the space provided. Make sure that you clearly erase all parts of the line that do not belong in the final graph.

$$h(x) = \begin{cases} -3x + 2, & x < 3 \\ 4, & 3 \leq x < 7 \\ 2x - 10, & x \geq 7 \end{cases}$$



Show All work!

1) Simplify and Classify by degree and number of terms. A.  $(-8d^3 - 7) - (-d^3 - d^2 - 6)$

B.  $x(x - 3) - 2x(x - 3)$

2) Write a polynomial function in standard form with the roots  $0, \frac{-2}{5}, 3$

3) Solve to find all the roots.  $x^3 - 64 = 0$

4) Solve to find all the roots.  $8x^3 - 1 = 0$

5) Divide using synthetic division.

$$(x^4 - 6x^2 - 27) \div (x + 2)$$

6) Divide using long division.

$$(7x^3 + 11x^2 + 7x + 5) \div (x^2 + 1)$$

7) Solve to find all zeros.

$$f(x)x^3 - 6x^2 + 4x + 16$$

8) Solve to find all zeros.

$$f(x) = x^3 - 9x^2 + 28x - 30$$

9) You want to make an open top box from cardboard. The original cardboard is 20 X 30. Find the maximum volume and the length of the cut. Round to the nearest hundredth.

10) Is  $(x - 3)$  a factor of  $x^3 - 4x^2 + x + 6 = 0$ ? If so, find the remaining factors.

11) Solve:  $x^4 - 12x^2 - 64 = 0$

12) Solve:  $x^4 - x^2 - 72 = 0$

13) Find the discriminant and describe the roots of  $3x^2 + 2x - 8 = 0$

$$x^2 - 2x = -7$$



14) Solve by completing the square  $x^2 - 6x - 15 = 0$

## I. Free Response – Must show all work! ( 3pts each)

1. Simplify and Classify by degree and number of terms  
 $3x(x - 2) - (x^2 - 2x - 1)$

2. Simplify and Classify by Degree and number of terms:  
 $x(x - 3) - x(x + 2)$

3 Divide using long division:  $(x^3 - 6x + 1) \div (x - 2)$

4. Divide using synthetic division:  
 $(x^4 - 3x^2 - 5x - 7) \div (x - 2)$

$2x^4$

5. Solve:  $x^4 - 4x^2 - 32 = 0$

6. Write a polynomial function in **standard form** with the given zeros:  $x = 0, 3, -1/5$

7. Solve:  $27x^3 - 1 = 0$

8. Find all the zeros:  $x^3 - 6x^2 + 4x + 16 = 0$

<p>9. Find all the zeros: <math>x^3 - 9x^2 + 28x - 30 = 0</math></p>	<p>10. Find all the zeros: <math>f(x) = x^3 - 3x^2 + x - 3</math></p>
<p>11. Is <math>x + 4</math> is a factor of the polynomial <math>3x^3 + 12x^2 - 3x - 12</math>? If so, find the remaining factors.</p>	<p>12 Write a polynomial in <b>factored form</b> with roots at <math>X = -5</math> with multiplicity 2, <math>x = -3</math> with multiplicity 3, and <math>x = 0</math> with multiplicity 1.</p>

<p>15. Application Problem  A metal worker wants to make an open box from a 12 in x 8 in sheet of metal by cutting equal squares from each corner. <b>ROUND TO THE NEAREST HUNDRETH!!</b></p>	
<p>a. Write a function for the Volume of the box.(1 pt)</p>	<p>b. Find the maximum volume of the box and the side length of the cut out squares that generates that volume. (2 pts)</p>

**Review. (3 pts each)**

<p>16. Solve using completing the square. <math>x^2 - 8x + 4 = 0</math></p>	<p>17. Find the discriminant and completely describe the roots <math>3x^2 + 2x = -1</math></p>
---	--

**H. Math 3 Final REVIEW for Unit 3**

Name \_\_\_\_\_

1) Write in exponential form $\ln x = p$	2) Write in log form $m^c = p$
3) Expand: $\log x^4 y^3$	4) Condense: $5\log_2 x - 4\log_2 m$
5) Simplify: $(5e^{-4x})^{-2}$	6) Solve: $e^{2x} - 5 = 19$
7) Solve: $14 - \ln(x - 3) = 8$	8) Solve: $25^{x+4} = 125^{3x-2}$
9) Solve: $\log_5(x + 3) + \log_5(x + 2) = \log_5 6$	10) Suppose you deposit \$4500 in an account that pays 3.5% interest compounded quarterly. How long will it take to reach \$7000?



**H. Math 3 Final REVIEW for Unit 3**

Name \_\_\_\_\_

11) Suppose you invest \$700 in the bank and it is compounded continuously at 4.25%. How long will it take to double?

12) A cup of coffee contains 140 mg of caffeine. If caffeine is eliminated from the body at a rate of 12% per hour, how long will it take for half of this caffeine to be eliminated?

13) Suppose you invest \$850 in a bank at 3.25% interest compounded monthly. How much money will you have in 8 years?

14) Evaluate :  $\log_2 8 - \log_2 4$

15) Harry purchased a car for \$26,700. The value of the car decreases by 13% every year. What will be the value of the car in 10 years?

16) Write a function that translates  $y = 3^x$  five units to the left and 4 units up

17) Solve:  $x^2 - 6x - 3 = 0$

18) Solve:  $2|x - 4| - 3 > 9$

19) Find  $f \circ g(x)$  if  $f(x) = x^2 - 7$  &  
 $g(x) = 3x - 2$

20) Find  $f^{-1}(x)$  if  $f(x) = 7x - 2$

**Part I – Multiple Choice. Circle the correct answer. (2 pts each)**

1. Which expression is the least common multiple of  $x^2 - 1$  and  $x^2 - x$ ?
- a.  $x^2(x-1)^2(x+1)^2$     b.  $x(x-1)^2(x+1)$     c.  $x-1$     d.  $x(x-1)(x+1)$
2. Simplify  $\frac{x^2+5x+4}{x^2+2x+1} \cdot \frac{2x+2}{x+4}$ .
- a.  $\frac{1}{2}$     b.  $\frac{(x+4)^2}{2(x+1)^2}$     c. 2    d.  $\frac{x+4}{2(x+1)}$

**Part II – Simplify. Circle answer**

3.  $\frac{x^2-4x}{x^2+7x-18} \cdot \frac{x^2-81}{x^2-11x+18}$
4.  $\frac{x+1}{5xy} \div \frac{x+1}{4x^2y}$
5.  $\frac{x^2+4x+3}{x^2+6x+9} \cdot \frac{2x+6}{2x+2}$
6.  $\frac{3z^2-15z+18}{z^2-4} \div \frac{z^2-2z-3}{z^2+4z+4}$

**Simplify. Addition/Subtraction.**

7.  $\frac{5}{x-2} - \frac{2}{x+3}$
8.  $\frac{3}{x^2+3x-10} + \frac{1}{x-2}$

$$9. \frac{x^2}{x^2 - x - 30} + \frac{4}{x - 6}$$

$$10. \frac{x}{x^2 + 4x + 4} + \frac{5}{x^2 - 4}$$

Solve each equation and check your solution.

$$11. \frac{1}{9} + \frac{1}{x} = \frac{4}{9}$$

$$12. \frac{1}{x - 4} = \frac{2}{x - 2}$$

$$13. \frac{2x}{x - 2} - \frac{1}{3} = \frac{1}{3x - 6}$$

$$14. \frac{6}{y + 2} + \frac{1}{y - 2} = 1$$

Simplify

$$16. \frac{\frac{5}{x + 3} + \frac{8}{x - 2}}{\frac{6}{x + 3}}$$

**Unit 4 Part 2 REVIEW NOTES**

Name \_\_\_\_\_

**Honors MATH 3**

Date \_\_\_\_\_ Period \_\_\_\_\_

**Complete the table.**

<i>Function</i>	<i>Horizontal Asymptote</i>	<i>Vertical Asymptote</i>	<i>Roots</i>	<i>y-intercepts</i>
1. $f(x) = \frac{x+1}{x+3}$				
2. $f(x) = \frac{2}{x^2 - 3x - 4}$				
3. $f(x) = \frac{9}{x+1} - 5$				

**DO WORK FOR THE FOLLOWING PROBLEMS ON NOTEBOOK PAPER!**

4. Simplify  $\frac{\frac{5}{x} + \frac{3}{2}}{\frac{2}{x+1} - \frac{4}{x}}$

\_\_\_\_\_

**Multiply/Divide.**

5.  $\frac{x^2 - x - 12}{x^2 + 3x} \div \frac{2x - 8}{x^2 - 9}$

\_\_\_\_\_

6.  $\frac{x^2 + 5x}{x^2 - 1} \cdot \frac{x^2 - x}{x^2 + 7x + 10} \cdot \frac{x^2 + 2x + 1}{x^3 + x^2}$

\_\_\_\_\_

**Add/Subtract.**

7.  $\frac{3}{x-3} - \frac{x+1}{x+2}$

\_\_\_\_\_

8.  $\frac{x+2}{x-1} + \frac{2}{x+6} + \frac{14}{x^2 + 5x - 6}$

\_\_\_\_\_

**Solve.**

9.  $\frac{x+2}{x^2 - 4} = \frac{3}{x}$

\_\_\_\_\_

10.  $\frac{10}{x^2-2x} + \frac{4}{x} = \frac{5}{x-2}$

---

11.  $\frac{3x}{x+1} + \frac{6}{2x} = \frac{7}{x}$

---

12. Simplify:  $\frac{6x^2-23x+7}{9x^2-1} \cdot \frac{3x^2-11x-4}{x^2+3x-28}$

---

13. Simplify:  $\frac{7}{x^2+4x-12} + \frac{x+3}{x^2+3x-18}$

---

I. Graphing. Complete the table for #1-3. No decimals!

Function	Root(s)	y-intercept	Horizontal Asymptote	Vertical Asymptote
1. $f(x) = \frac{4}{x-2} + 7$				
2. $f(x) = \frac{3x+1}{x-4}$				
3. $f(x) = \frac{(x-6)(x+3)}{3x-2}$				

II. Simplify. List all restrictions. ( 4 pts each)

<p>4. <math>\frac{x^2 - 3x - 10}{2x^2 - 11x + 5} \div \frac{x^2 - 5x + 6}{2x^2 - 7x + 3}</math></p>	<p>5. <math>\frac{x^2 + 6x}{3x^2 + 6x - 24} \cdot \frac{x^2 + 2x - 8}{x + 6}</math></p>
<p>6. <math>\frac{9}{x^2 - 1} - \frac{x - 2}{x + 1}</math></p>	<p>7. <math>\frac{x + 2}{x^2 + 4x + 4} + \frac{2}{x + 2}</math></p>

8. 
$$\frac{\frac{4}{x+2}}{\frac{3}{4} + \frac{5}{x+2}}$$

9. 
$$\frac{\frac{4}{x^2-9} + \frac{2}{x-3}}{\frac{1}{x+3} + \frac{1}{x-3}}$$

III. Solve. (4 pts each)

10. 
$$\frac{5}{x+2} + \frac{x}{x-2} = \frac{8}{x^2-4}$$

11. 
$$\frac{7}{x^2-5x} + \frac{2}{x} = \frac{3}{2x-10}$$

IV. Graph the following. (5 pts)

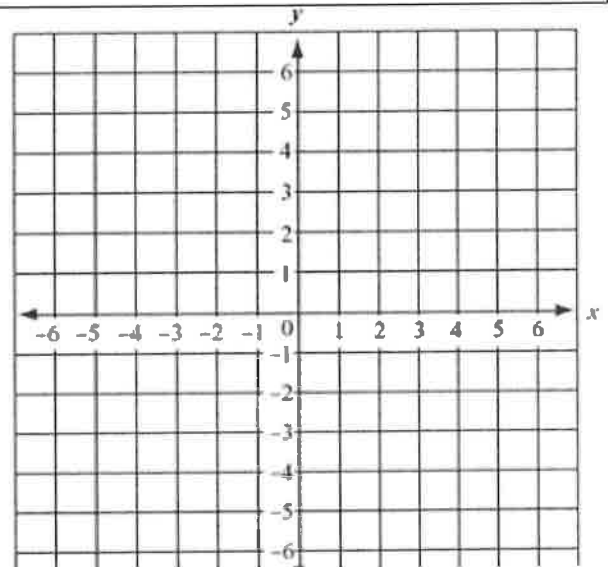
12. 
$$y = \frac{3}{x-2}$$

Vertical Asymptote \_\_\_\_\_

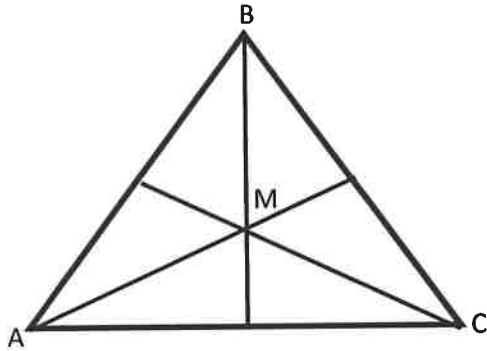
Horizontal Asymptote \_\_\_\_\_

Domain \_\_\_\_\_

Range \_\_\_\_\_

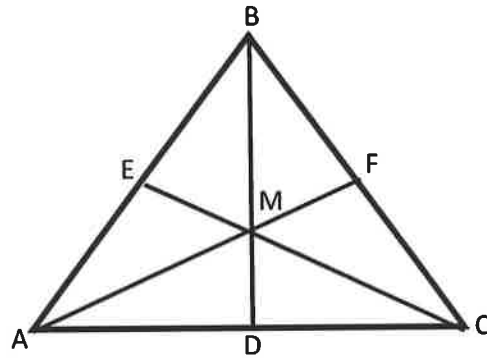


1.  $M$  is the incenter of  $\triangle ABC$ ,  $m\angle CBM = 27^\circ$ , and  $m\angle CAM = 35^\circ$ . Solve for  $m\angle ACB$ .



$m\angle ACB = \underline{\hspace{2cm}}$

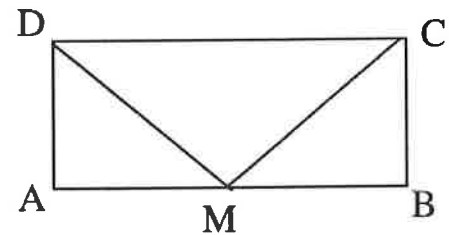
2.  $M$  is the centroid of  $\triangle ABC$ , with  $EB = 13$ ,  $MF = 7$ , and  $BM = 16$ . Solve for the following:



$AB = \underline{\hspace{2cm}}$        $AM = \underline{\hspace{2cm}}$

$BD = \underline{\hspace{2cm}}$        $MD = \underline{\hspace{2cm}}$

3. Given:  $\square ABCD$  is a rectangle, and  $M$  is the midpoint of  $\overline{AB}$ .  
 Prove:  $\overline{DM} \cong \overline{CM}$

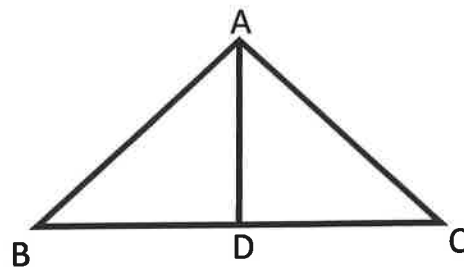
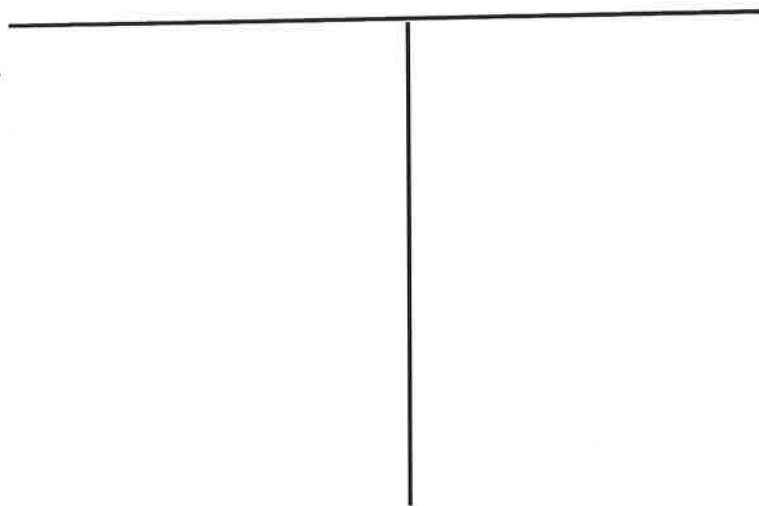


Statements	Justifications
1.	1. Given



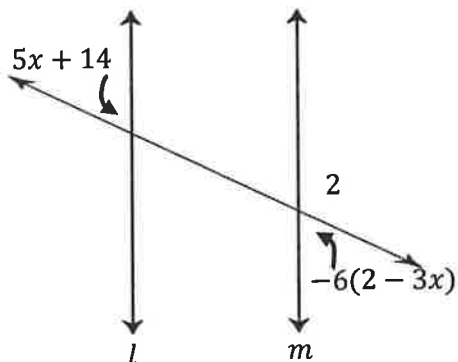
4. Given:  $\overline{BA} \cong \overline{CA}$ , and  $\overline{BC} \perp \overline{DA}$ .  
 Prove:  $\triangle ABD \cong \triangle ACD$ .

1.



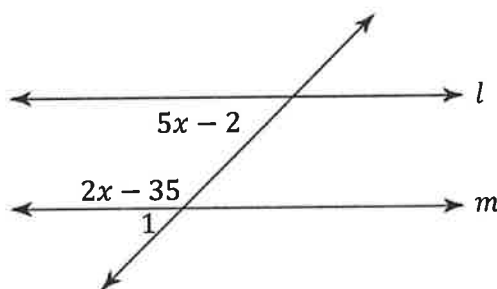
In question 5 and 6 expressions are given that represent angle measures. Given  $\vec{l} \parallel \vec{m}$ , solve for  $x$  and the angle named.

5.



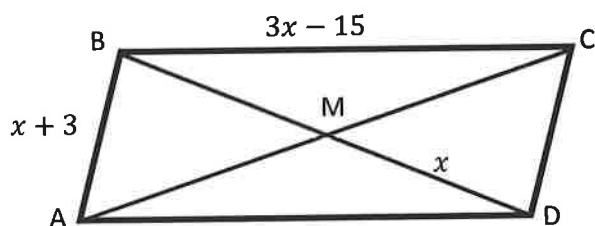
$x = \underline{\hspace{2cm}}$        $m \angle 2 = \underline{\hspace{2cm}}$

6.



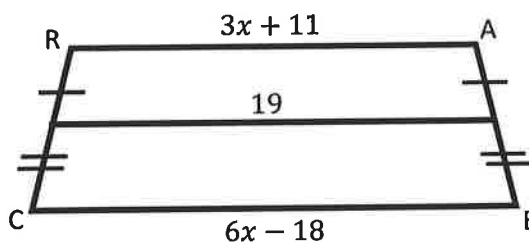
$x = \underline{\hspace{2cm}}$        $m \angle 1 = \underline{\hspace{2cm}}$

7. What is the length of BD in rhombus ABCD?  $DM = x$



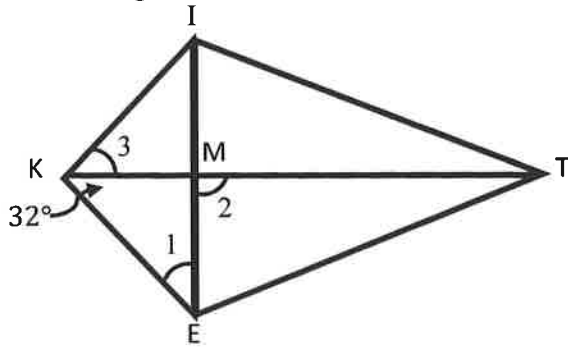
$BD = \underline{\hspace{2cm}}$

8. Given isosceles trapezoid CRAB, what is RA?



$RA = \underline{\hspace{2cm}}$

9. Given  $\square$ KITE is a kite, solve for the measure of the marked angles.

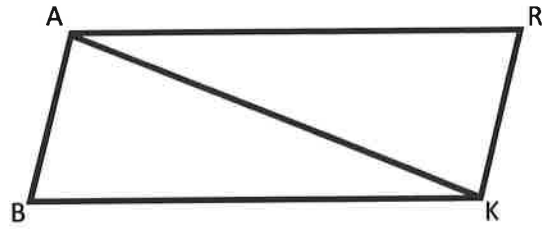


$m \angle 1 = \underline{\hspace{2cm}}$

$m \angle 2 = \underline{\hspace{2cm}}$

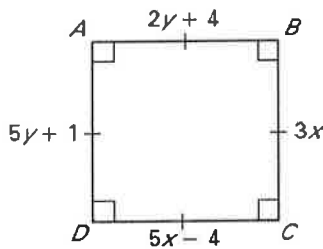
$m \angle 3 = \underline{\hspace{2cm}}$

10.  $\square$ BARK is a parallelogram, with  $m \angle R = 90^\circ$ , and  $\overline{BA} \cong \overline{AR}$ . Solve for  $m \angle BAK$ .



$m \angle BAK = \underline{\hspace{2cm}}$

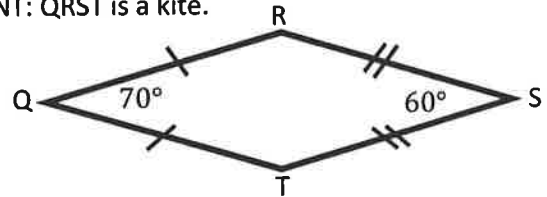
11. Find the values of  $x$  and  $y$  such that  $\square$ ABCD is a square.



$x = \underline{\hspace{2cm}}$

$y = \underline{\hspace{2cm}}$

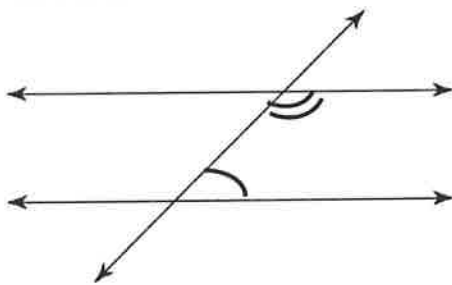
12. Solve for the measure of angles R and T.  
HINT: QRST is a kite.



$m \angle R = \underline{\hspace{2cm}}$

$m \angle T = \underline{\hspace{2cm}}$

13. Fill in the blanks below.



The two angles marked are \_\_\_\_\_ angles  
and are \_\_\_\_\_.  
Complementary or Supplementary?

14. Given the parallelogram, solve for  $x$  and  $y$ .



$x = \underline{\hspace{2cm}}$

$y = \underline{\hspace{2cm}}$

Round all answers to the nearest tenth. \*2pts each

1. Write the equation of a circle with center (5,-3) and a diameter of 8.

\_\_\_\_\_

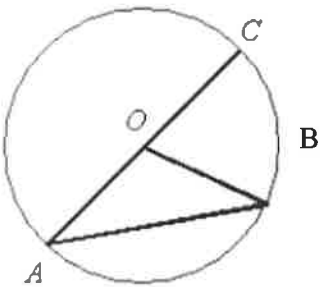
2. If a central angle of a circle with radius of 6 cm measures  $70^\circ$ , find the length of its intercepted arc.

\_\_\_\_\_

3. What is area of a sector formed by a  $36^\circ$  angle in a circle with radius of 7-in?

\_\_\_\_\_

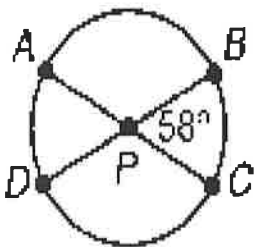
4. Given: In  $\odot O$ ,  $m\widehat{BAC} = 300^\circ$ . Find  $m\angle B$ .



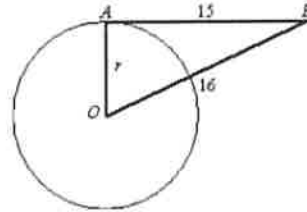
\_\_\_\_\_

Find the measure of  $\widehat{DBC}$  in  $\odot P$ .

\_\_\_\_\_



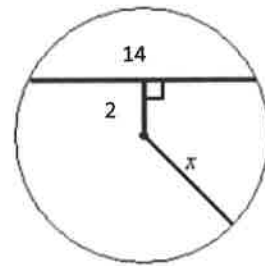
6. You are standing at point  $B$ . Point  $B$  is 16 feet from the center of the circular water storage tank and 15 feet from point  $A$ .  $\overline{AB}$  is tangent to  $\odot O$  at  $A$ . Find the radius of the tank.



\_\_\_\_\_

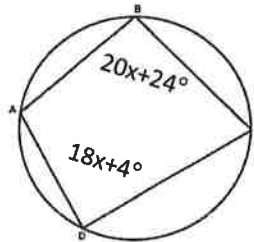
7. Find  $x$ .

\_\_\_\_\_

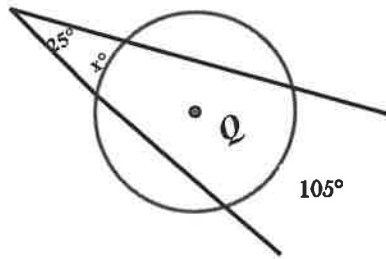


8. Find  $\angle D$ .

\_\_\_\_\_

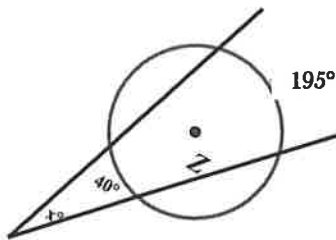


9. Find the measure of the arc indicated.



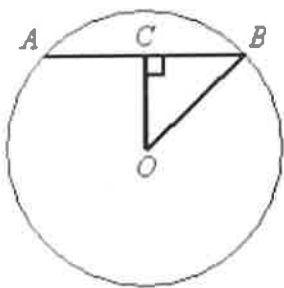
\_\_\_\_\_

10. Find the measure of the angle indicated.



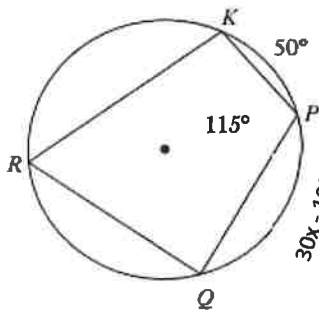
\_\_\_\_\_

11. Given circle  $O$  with radius 17 and  $OC = 8$ . Find the length of  $\overline{AB}$ .



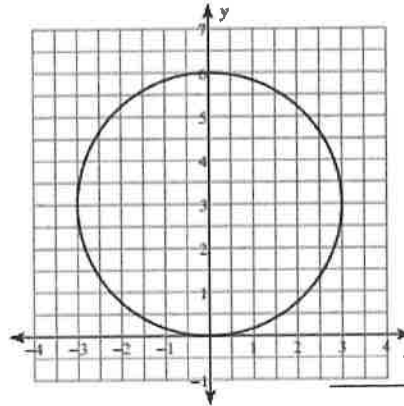
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12. Find the value of  $x$ .



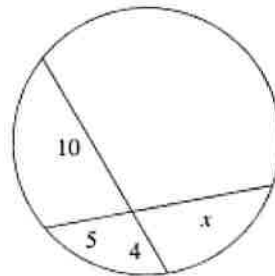
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18. Write the equation for the picture below.



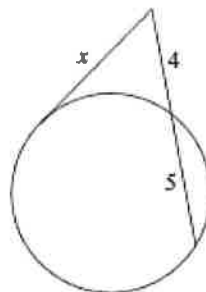
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19. Find  $x$



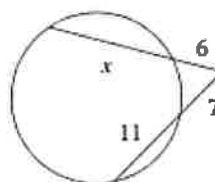
\_\_\_\_\_

20. Find  $x$



\_\_\_\_\_

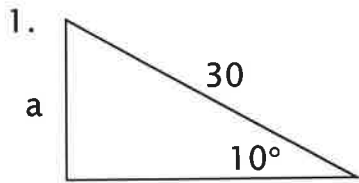
21. Find  $x$



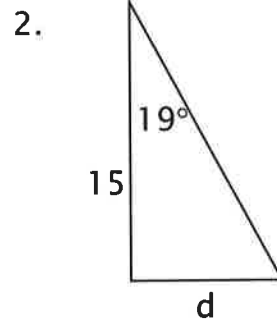
\_\_\_\_\_

17. Write the following equation of a circle in standard form  $x^2 + y^2 + 4x - 6y + 4 = 0$ .

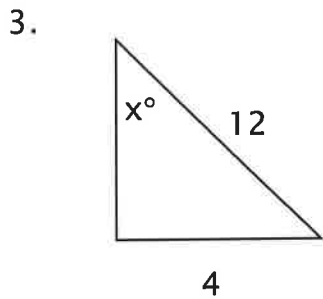
All triangles are right triangles. Solve for the variables. (2 pts. each)



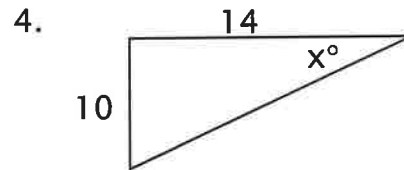
$$a = \text{-----}$$



$$d = \text{-----}$$



$$x = \text{-----}$$

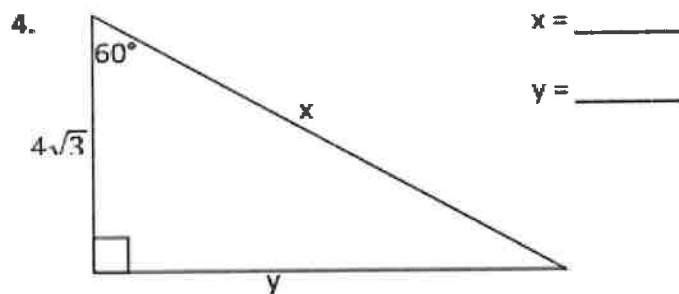
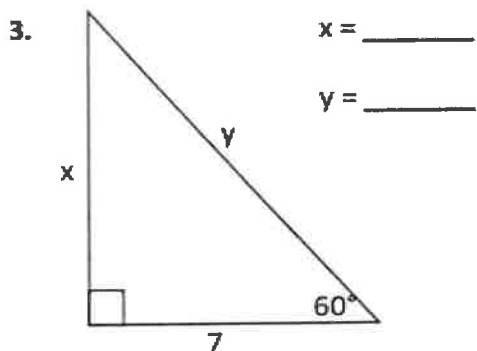
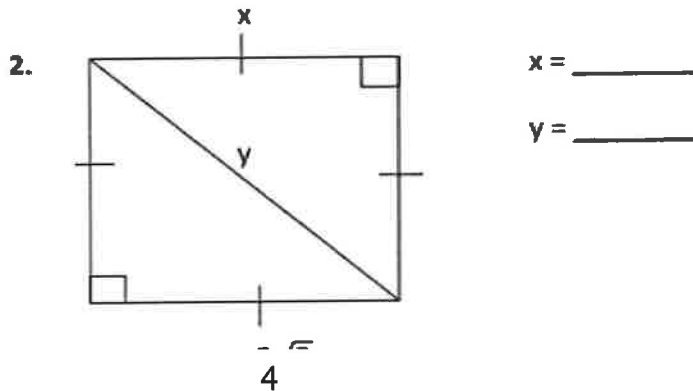
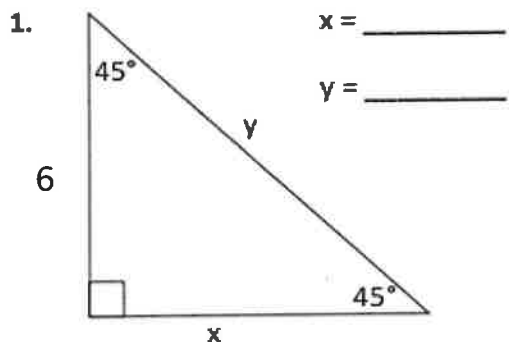


$$x = \text{-----}$$

**II. II. Convert each. (2 pts ea.) (Show your work!!)**

5.  $160^\circ$  to radians

6.  $\frac{7\pi}{5}$  to degrees



Multiple Choice (16 each)

5. Which angle is coterminal to  $120^\circ$ ?

- a. 120 radians
- b.  $240^\circ$
- c.  $-120^\circ$
- d.  $-240^\circ$

7. What is the exact value of  $\sin 30^\circ$ ?

- a.  $\frac{\sqrt{3}}{2}$
- b.  $\frac{1}{2}$
- c.  $-\frac{\sqrt{3}}{2}$
- d.  $\frac{\sqrt{2}}{2}$

6. Which angle is coterminal to  $\frac{2\pi}{7}$ ?

- a.  $\frac{30\pi}{7}$
- b.  $-\frac{2\pi}{7}$
- c.  $-\frac{2\pi}{7}$
- d.  $\frac{2\pi}{7}$

8. Which angle has a cosine of  $-\frac{\sqrt{3}}{2}$ ?

- a.  $60^\circ$
- b.  $300^\circ$
- c.  $150^\circ$
- d.  $120^\circ$

Find the following. (1 pt. each)

9.  $\sin 150^\circ$

10.  $\cos \frac{2\pi}{3}$

11.  $\tan 300^\circ$

12.  $\tan \pi$

13.  $\sin 240^\circ$

14.  $\tan \frac{7\pi}{6}$

15.  $\cos 180^\circ$

16.  $\tan 45^\circ$

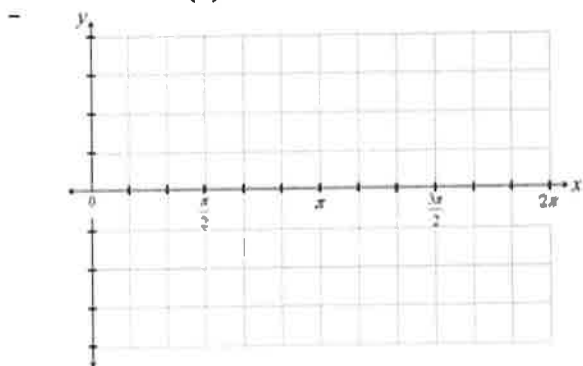
17.  $\sin \frac{3\pi}{2}$

18. The point P has coordinates (3,-1) and is on the terminal side of angle  $\theta$ . Evaluate the six trigonometric functions for  $\theta$ . If the function is undefined, write "undefined." (1pt each)

$\sin \theta$	$\cos \theta$	$\tan \theta$
$\csc \theta$	$\sec \theta$	$\cot \theta$

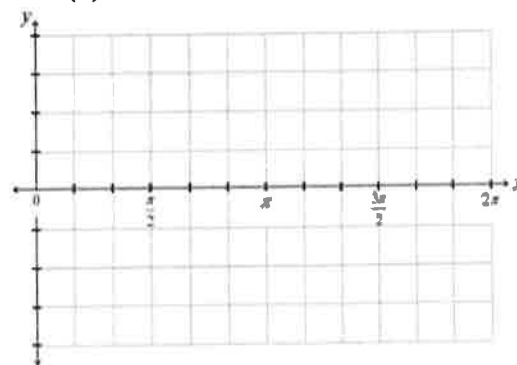
GRAPH THE FOLLOWING. Show at least 5 exact points.

19.  $Y = 2\sin(x) - 1$



Period \_\_\_\_\_ Amplitude \_\_\_\_\_

20.  $y = \cos(x) + 2$



Period \_\_\_\_\_ Amplitude \_\_\_\_\_