

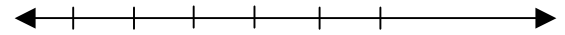
**Part I. Show all work for possible partial credit. 5 points each.**

1. Solve the equation for  $x$ .  $10x + 2(6 - x) = 5x + 3$

2. Solve the inequality, giving its solution set in both interval and graph forms.

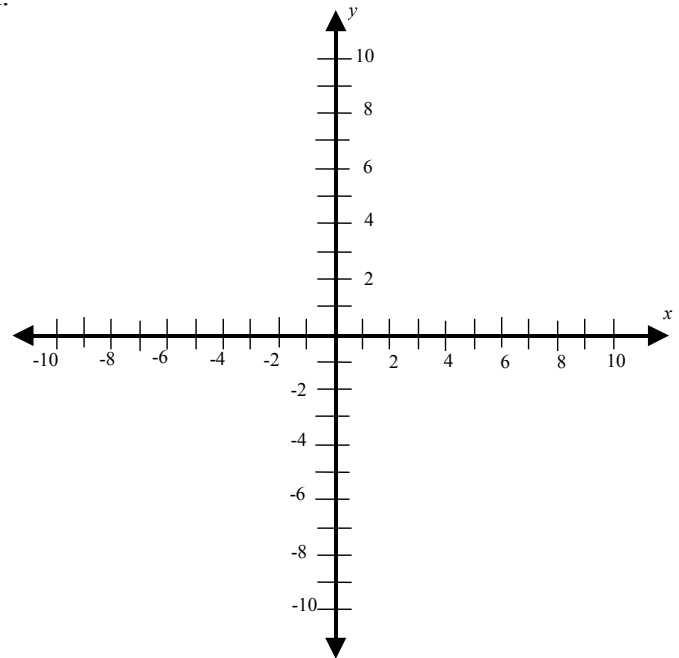
$$\frac{4 - 3k}{5} > 3$$

Graph solution:



Interval solution:

3. Find the intercepts and use them to graph the equation.  
 $3x - 5y = 18$



4. Find the slope of the line containing the pair of points  $(2, -3)$  and  $(2, -\frac{1}{3})$ .

If it does not exist, indicate so.

5. Give the domain:  $y = \frac{3}{x - 2}$

6. Simplify the expression:  $-2^2 + \left(\frac{1}{2}\right)^3$

7. Find the greatest common factor for the list of terms:  $15m^2p^2, 6mp^2, 20mnp^3$

8. Divide:  $\frac{x^2 - 3x + 20}{x + 3}$

9. Factor:  $x^3 + 2x^2 - 3x - 6$

10. Factor:  $6x^2 - 11x + 3$

11. Given  $f(x) = 3x^2 - x^2$ , evaluate

(a)  $f(-3)$       (b)  $f\left(\frac{1}{2}\right)$

12. Express in lowest terms:  $\frac{8n^2(n+7)^2}{20n(n+7)^2}$

13. Express the radical in simplified form. Assume that all variables represent positive real numbers.

(a)  $\sqrt{45a^4b}$

(b)  $\sqrt[3]{27a^6b^2}$

14. Rationalize the denominator:  $\frac{4}{\sqrt{5} + \sqrt{3}}$

15. Solve for  $y$ .  $x = \frac{6y - 3}{y}$

16. Identify the **vertex** of the graph of each quadratic function.

(a)  $f(x) = -2x^2$

(b)  $f(x) = (x + 2)^2 - 4$

Vertex: ( , )

Vertex: ( , )

**Part II. Show all work for possible partial credit. 8 points each**

17. Solve for  $x$ .  $\frac{3x+2}{7} - \frac{x+4}{5} = 3$

18. Find the equation of the line through the point  $(3,-4)$  and parallel to  $y = 2x - 5$ .

The standard form of the equation is  $\Rightarrow \square x + \square y = \square$ .

The slope intercept form is  $\Rightarrow y = \square x + \square$ .

19. Simplify the expression. Express using only positive exponents.  $(4a^{-2})^3(a^{-2})^{-4}$

20. For the following pair of functions, find the following. Be sure to express in simplest form.

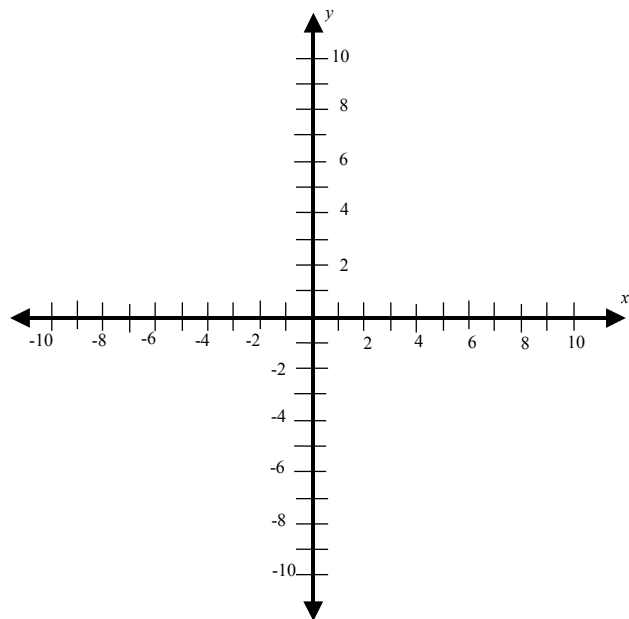
$$f(x) = 4x^2 - 5 \text{ and } g(x) = -2x^2 + x + 7$$

(a)  $(f - g)(x) =$

(b)  $(f + g)(1) =$

21. Graph the function by creating a table of ordered pairs.

$$f(x) = -x^3 + 2$$



22. Perform the indicated operation. Reduce to lowest terms.

$$\frac{6}{s^2 - 4} + \frac{5}{2s + 4} =$$

23. Simplify; Use only positive exponents. Assume all variables represent positive real numbers.

$$\frac{m^{-1/2}n^{3/4}}{(m^2n)^{1/2}}$$

24. Graph the function and give its domain and range.

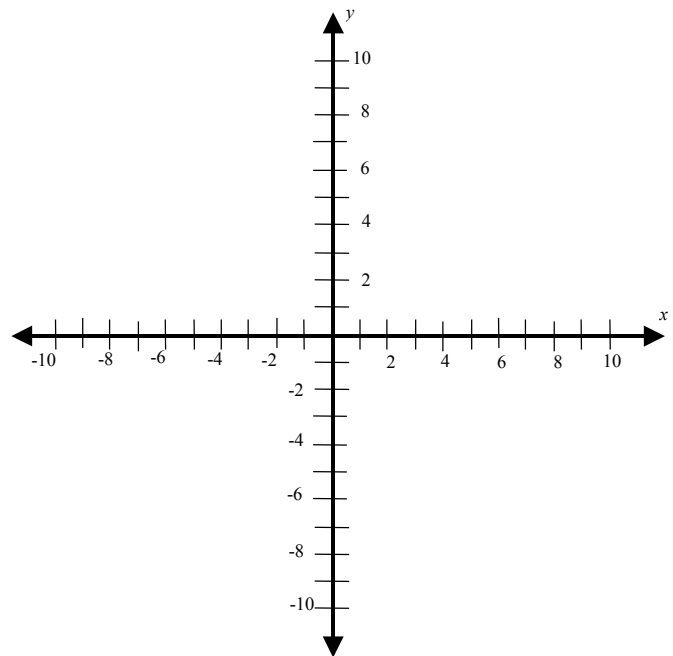
$$f(x) = -\sqrt{x}$$

(a) Choose the domain.

- (A)  $(-\infty, \infty)$       (B)  $(0, \infty)$   
(C)  $[0, \infty)$       (D)  $(-\infty, 0]$

(b) Choose the range.

- (A)  $[0, \infty)$       (B)  $(-\infty, 0]$   
(C)  $(-\infty, \infty)$       (D)  $(0, \infty)$

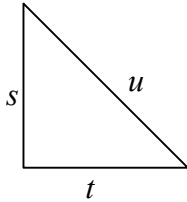


25. Multiply and simplify the product.  $(5\sqrt{x} + 2)^2$ .

26. Solve  $z = \sqrt{\frac{7hc}{q}}$  for  $q$ .

27. Solve the equation.  $x^2 - 2x = 4$

28. The two legs of a right triangle are  $s$  and  $t$ . The hypotenuse is  $u$ . Solve for  $s$  in terms of the other variables.

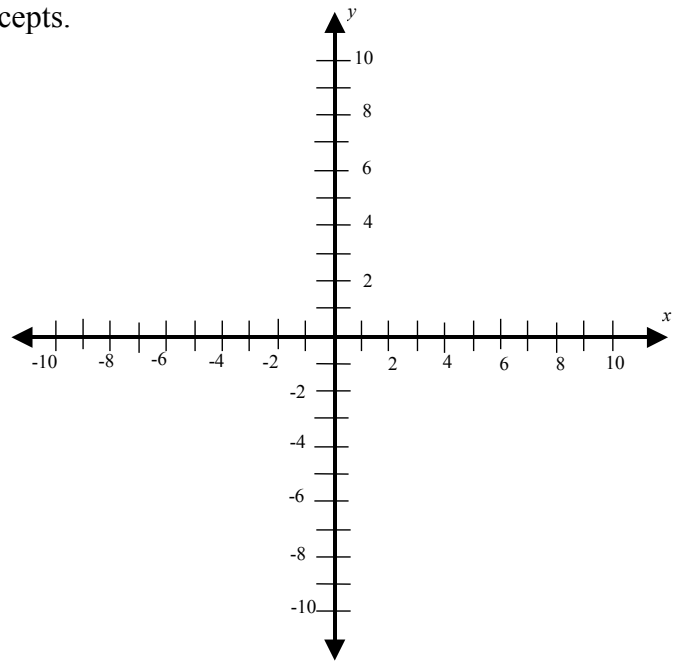


**Part III. Choose 3 of the following 6 problems. You must indicate the 3 problems to be graded. If not, we will grade the first four. Show all work for possible partial credit. 8 Points Each.**

29. Sketch the graph of the parabola. Label all intercepts.

Grade

$$f(x) = x^2 - 5$$



30. Solve  $x^4 - 14x^2 + 45 = 0$ .

Grade

31. The length of the top of a table is 5m greater than the width. The area is  $104\text{m}^2$ . Find the dimensions of the table

Grade

32. Solve  $\sqrt{7x+4} = x+2$ . Check all solutions.

Grade

33. How many gallons of a 60% antifreeze solution must be mixed with 20 gallons of a 15% antifreeze solution to get a mixture that is 40% antifreeze. Write the appropriate equation but do not bother to solve.

34. Solve for  $x$ .  $\frac{6}{y+3} + \frac{2}{y} = \frac{5y-3}{y^2-9}$

**BE SURE YOU HAVE MARKED THE 3 PROBLEMS TO BE GRADED.**