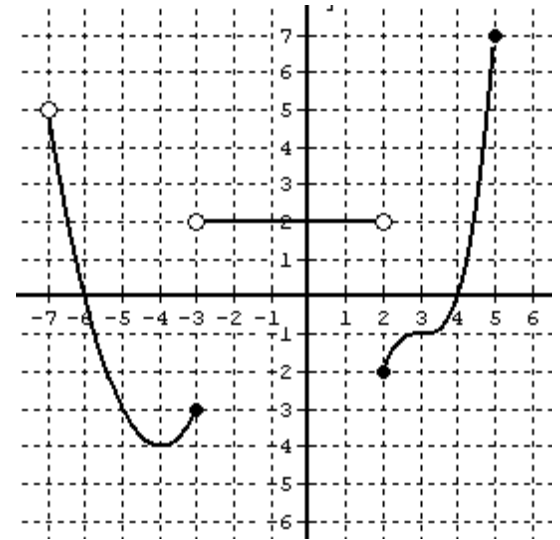


1) Use the graph to the right to answer questions A – S.

- A) Is the graph a function?
- B) Domain:
- C) Range:
- D)  $x$ -intercept(s):
- E)  $y$ -intercept:
- F) Absolute Maximum value:
- G) Absolute Minimum value:



For items H – L, State the corresponding x-values using Interval Notation..

- H) Where is the graph increasing?
- I) Where is the graph decreasing?
- J) Where is the graph constant?
- K) Where is  $f(x) \geq 0$ ?
- L) Where is  $f(x) < 0$ ?

- M) How many times does the line  $y = -2$  intersect the graph?
- N) Find  $f(-5)$
- O) Find  $f(-3)$
- P) Find  $f(2)$
- Q) Where does  $f(x) = 0$  ? List the corresponding value(s) of  $x$ .
- R) Where does  $f(x) = -3$  ? List the corresponding value(s) of  $x$ .

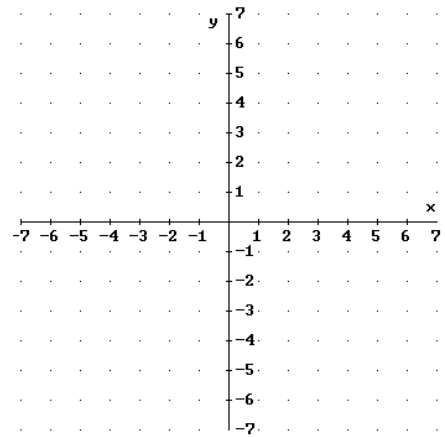
S) Find an equation of the piecewise-defined function graphed above:

$$f(x) = \left\{ \begin{array}{l} \text{for} \\ \text{for} \\ \text{for} \end{array} \right.$$

2) **Graph the Circle:**  $(x - 2)^2 + (y + 4)^2 = 9$

B) State the Domain:

C) State the Range:



3) Let  $f(x) = 3x^2 + 2x - 1$  and  $g(x) = 2x - 7$ . Find the following:

A)  $f(-2)$

B)  $(f + g)(1)$

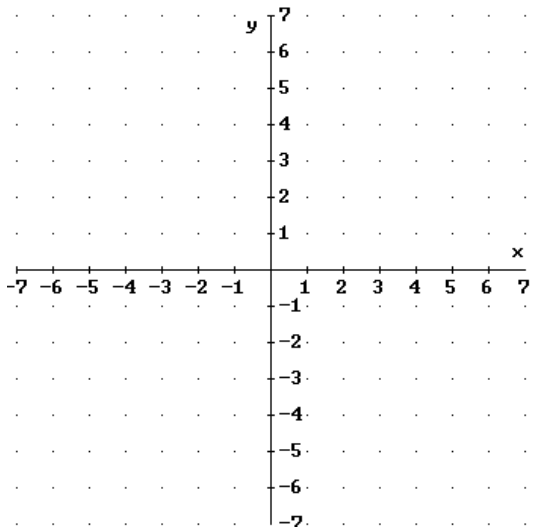
C)  $(f \circ g)(5)$

D)  $(f - g)(x)$

E)  $g(f(x))$

F) Find the inverse function  $g^{-1}(x)$

4) Sketch the **graph** of  $f(x) = \frac{x^2 - 1}{x^2 - 4}$ . Be sure to show all asymptotes with dotted lines

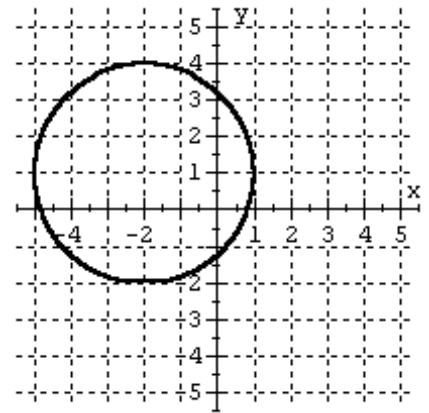
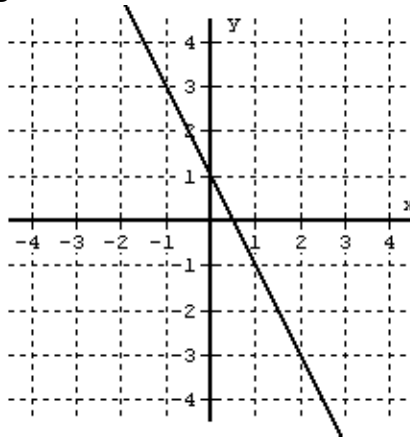
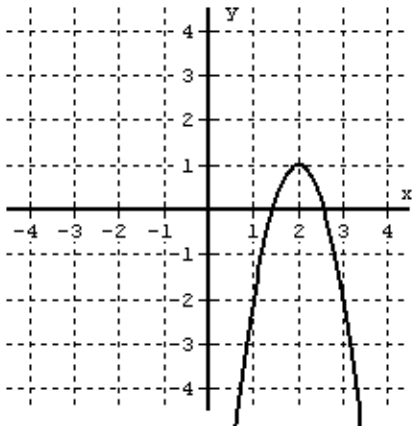


Where is (x-values):

$$f(x) \geq 0$$

$$f(x) \leq 0$$

Find an equation of the following relations



5) \_\_\_\_\_

6) \_\_\_\_\_

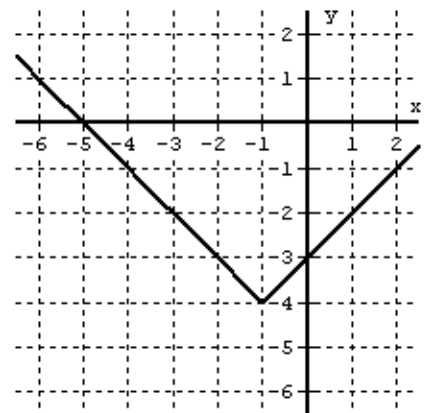
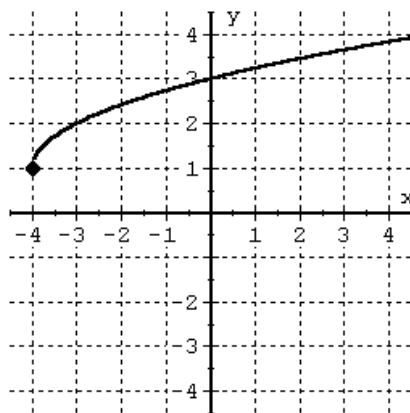
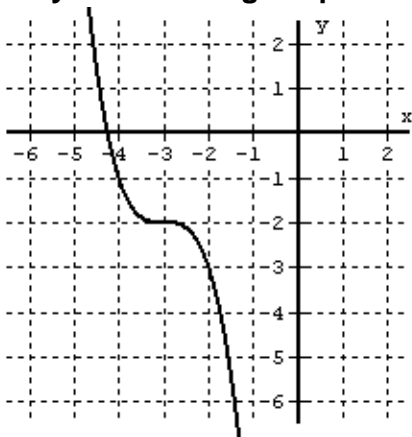
7) \_\_\_\_\_

Hints:  $y = a(x - h)^2 + k$

$y = mx + b$

$(x - h)^2 + (y - k)^2 = r^2$

Use your knowledge of parent functions and transformations to find an equation of the following

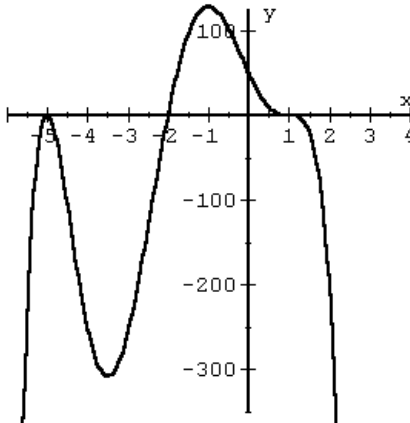
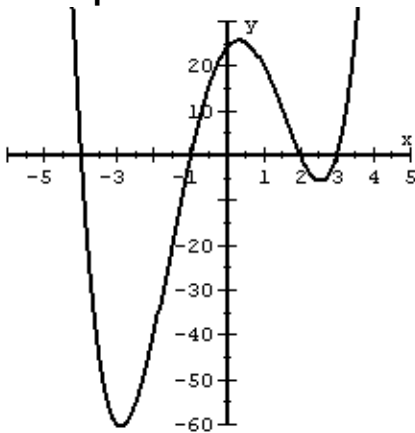


8) \_\_\_\_\_

9) \_\_\_\_\_

10) \_\_\_\_\_

Give a possible factorization of the following polynomials. Do NOT multiply out the factors!



$f(x) = 6x^3 + 11x^2 - 3x - 2$

11) \_\_\_\_\_

12) \_\_\_\_\_

13) \_\_\_\_\_

14) Use the **quadratic formula** to solve:  $3x^2 - 8x + 2 = 0$   
Simplify your answer completely.

15) Solve (Exact answers only):  $x^4 - 3x^3 - 9x^2 + 15x + 20 = 0$

16) The normal healing of wounds can be modeled by the exponential function  $A(t) = A_0 e^{-0.35t}$  where  $A_0$  represents the original area of the wound and  $A(t)$  equals the area of the wound after  $t$  days, assuming no infection is present. Suppose that a wound initially has an area of 200 square millimeters.

A) If healing is taking place, how large should the area of the wound be after 2 days?

B) If healing is taking place, when should the area of the wound be 50 square millimeters?  
(You can use your graphing calculator or solve the equation by hand, whichever you prefer)

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**Solve the Following Equations by Hand. Show your work! Use your calculator to evaluate your final answer - round your answer to 2 decimal places.** Remember, you can check your answers using your graphing calculator, however, only partial credit will be earned by only using the CALC/intersect tool on your graphing calculator to find the solutions.

17)  $e^{x+1} = 40$

18)  $2^x = 50$

19)  $\log(3x) = 2$

20)  $\log_3(5x + 1) = 2$