QUIZ 14 OVERALL QUIZ 3 FINAL PREP

1) Match the graph to one of the following functions.

A. $y = 5^x$ B. $y = 5^{-x}$

C. $y = -5^x$ D. $y = -5^{-x}$

E. $y = 5^x - 1$ F. $y = 5^{x-1}$ *Reflects across y*

G. $y = 5^{1-x}$ H. $y = 1 - 5^x$

2) Solve the following logarithmic equation.

$$\log(2x + 4) = 1 + \log(x - 7)$$

$$\log(2x + 4) - \log(x - 7) = 1$$

$$\frac{2x+4}{x-7} = 10^1 \qquad \text{cross multiply}$$

$$10x-70 = 2x+4$$

$$6x = 74$$

$$x = \frac{37}{2}$$

3)

Use the graph of the function f shown to the right to answer parts (a)-(n).

(a) Find f(– 14) and f(– 4).

f(– 14) = **-6**   Find y when x is -14
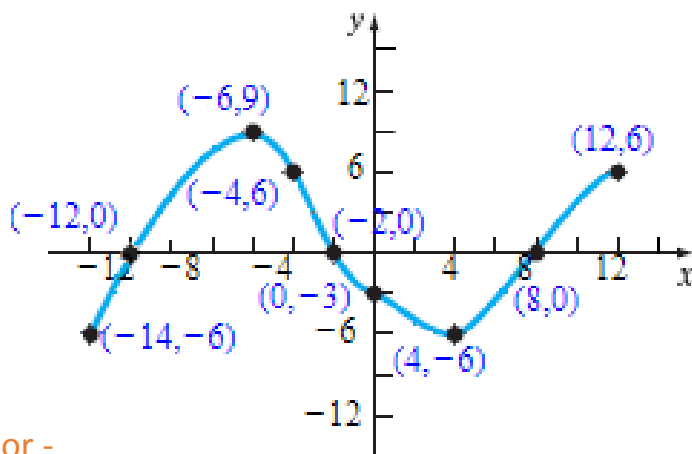
f(– 4) = **6**   Find y when x is -4

(b) Find f(12) and f(0).

f(12) = **6**

f(0) = **-3**

(c) Is f(4) positive or negative?

○ Positive   At x = 4 is the y value + or -

✔ Negative

(d) Is f(– 4) positive or negative?

✔ Positive   At x = -4 is the y value + or -

○ Negative

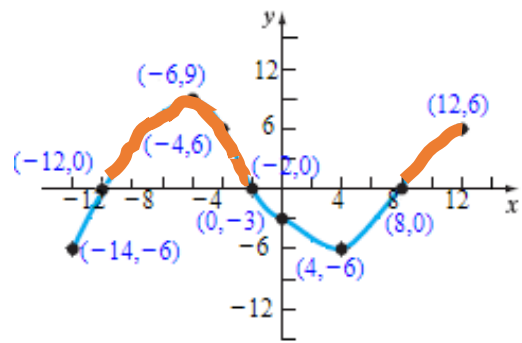(e) For what value(s) of x is f(x) = 0?

Look for the coordinates with (____, 0)

x = **-12, -2, 8**

(Use a comma to separate answers as needed.)

(f) For what values of x is f(x) > 0?

-12<x<-2, 8<x≤12

The intervals above the x-axis with end ≤

(g) What is the domain of f?

The domain of f is **{x|-14≤x≤12}** Most left point and most right point
(Type a compound inequality.)

(h) What is the range of f?

The range of f is **{y|-6≤y≤9}** Lowest and highest point
(Type a compound inequality.)

(i) What are the x-intercept(s)? Where the graph touches the x-axis

(j) W **-12, -2, 8,** t(s)? Where the graph touches the y-axis

y = **-3**
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

(k) How often does the line y = 1 intersect the graph?

If you draw a horizontal line at 1

3 times

(l) How often does the line x = 2 intersect the graph?

If you draw a vertical line at

1 times

(m) For what value(s) of x does f(x) = − 6?

x =-14, 4 Give x where y is -6
(Use a comma to separate answers as needed.)

(n) For what value(s) of x does f(x) = 9?

Give x where y is 9
x = -6
(Use a comma to separate answers as needed.)

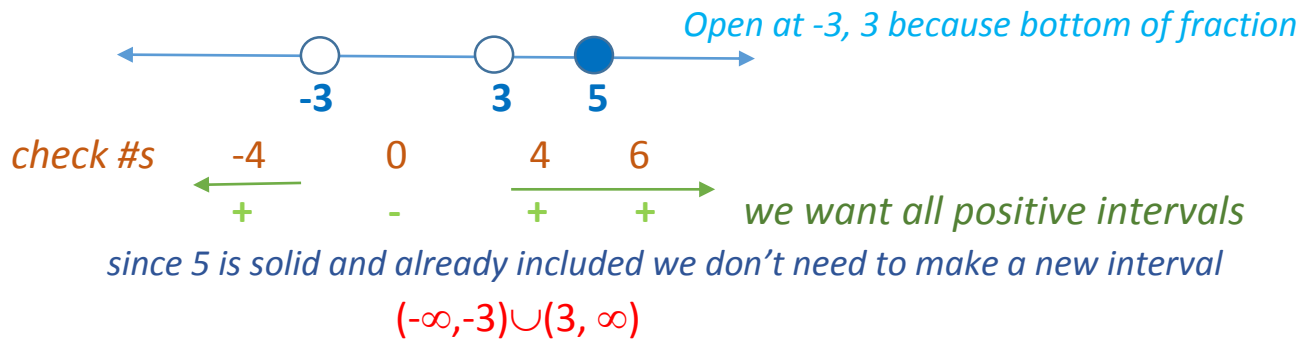**4)** Solve the following equation.

$$\log_2(6x + 4) = 3$$

$6x + 4 = 2^3$

$6x = 4$ $x = \dfrac{2}{3}$

5) Solve the inequality $\frac{(x-5)^2}{x^2-9} \geq 0$

we check all the critical points on a number line   x = -3, 3, 5

Open at -3, 3 because bottom of fraction

check #s   -4   0   4   6

+   -   +   +   *we want all positive intervals*

since 5 is solid and already included we don't need to make a new interval

$(-\infty,-3)\cup(3, \infty)$

6) Find the real solutions of the equation.

$5(s+5)^2 - 39(s+5) = 8$ Let u = s + 5

$5u^2 - 39u - 8 = 0$

$u^2 - 39u - 40 = 0$ s + 5 = 8   s + 5 = -⅕

$\dfrac{(u-40)(u+1) = 0}{5 \qquad\quad 5}$

u = 8,-⅕   s = 3, -5⅕

7) Find the real solutions, if any, of the following equation. Use the quadratic formula.

$2 - \dfrac{1}{x} - \dfrac{5}{x^2} = 0$ Multiply by x² first

$2x^2 - x - 5 =$ *does not factor*

$\dfrac{1 \pm \sqrt{1 - 4\cdot 2\cdot(-5)}}{4}$

$X = \dfrac{1+\sqrt{41}}{4}, \dfrac{1-\sqrt{41}}{4}$

8) Starting with the graph of a basic function, graph the following function using the techniques of shifting, compressing, stretching, and/or reflecting. Find the domain and range of the function.

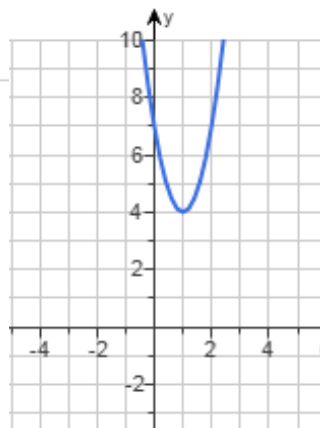$g(x) = 3(x-1)^2 + 4$

Use the graphing tool to graph the equation.

Plot the vertex using shifts

The domain of g(x) $(-\infty,\infty)$.
(Type your answer in interval notation.)

The range of g(x) $[4,\infty)$.
(Type your answer in interval notation.)

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9) Form a polynomial whose zeros and degree are given.

Zeros: -4, multiplicity 1; 1, multiplicity 2; degree 3

$(x+4)(x-1)^2$

$(x+4)(x^2 - 2x +1)$
$x^3 - 2x^2 + x + 4x^2 - 8x +4$
$x^3 + 2x^2 - 7x + 4$

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10) Find the domain of the following rational function.

$F(x) = \dfrac{9x(x-8)}{2x^2 - 9x - 5}$

Factor the bottom using slide and divide

$2x^2 - 9x - 5 = 0$
$x^2 - 9x - 10 = 0$
$(x - 10)(x + 1) = 0$
$\quad\quad 2\quad\quad\quad 2$

$x = 5, -\tfrac{1}{2}$