Name:_____ Date:_____

Math 12 Honours: HW Section 2.1 Graphing and Solving Basic Functions

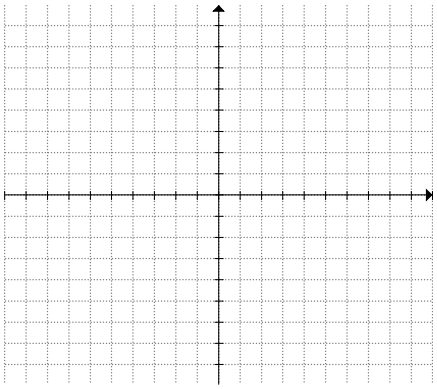
1. When looking at a radical function, how do you tell which way (LEFT/RIGHT/UP/DOWN) the graph opens towards? Explain: $y = a\sqrt{b+cx}$

2. How do you distinguish between having NO solutions vs having an Extraneous root? Explain: $a\sqrt{b+cx} = mx + p$

3. What is the difference between a function and a relation? Explain:

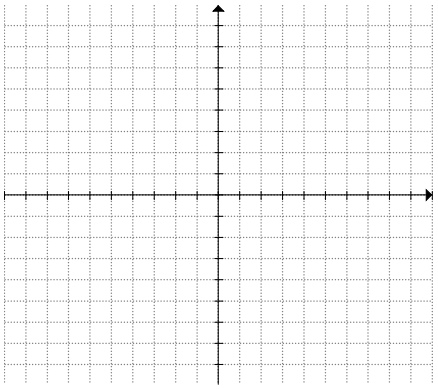
4. Given each of the following functions or relations, and then indicate the domain and range:

a) $y = 2(x-4)^2 - 12$



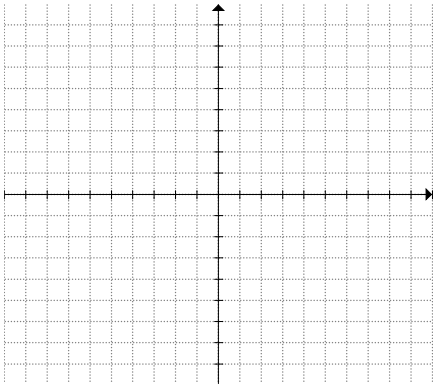
Domain: Range:

b) $(x+1)^2 + (y-1)^2 = 25$



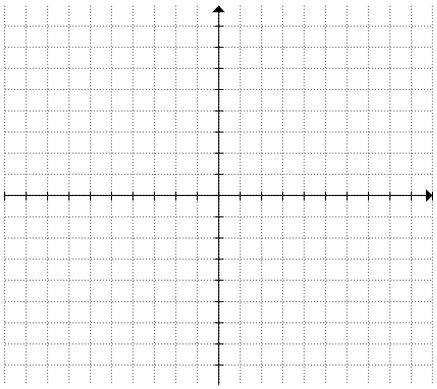
Domain: Range:

c) $y = -0.5(x-1)(x+3)(2x-5)$



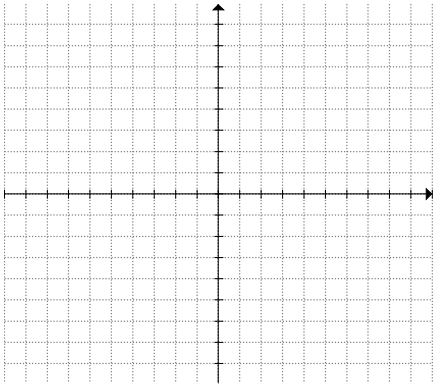
Domain: Range:

d) $y = -\sqrt{3x+1}$



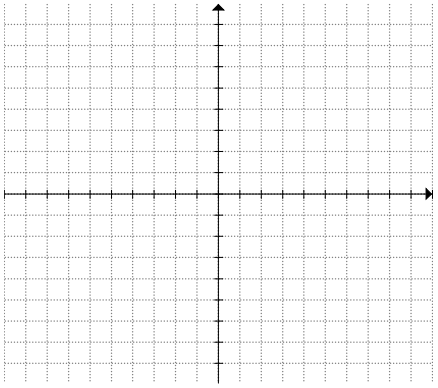
Domain: Range:

e) $x^2 + 8x + y^2 - 2y - 1 = 9$



Domain: Range:

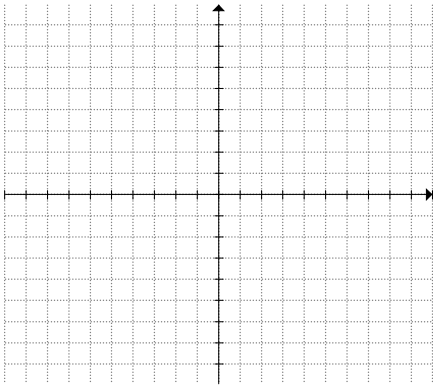
f) $y = (x-2)^3(x+1)^2$



Domain: Range:

5. Graph the following functions/relations. Indicate the domain, range and the equation of all the asymptotes:

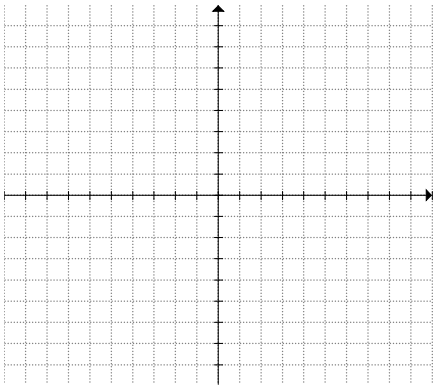
a) $y=-2(0.5)^2+3$



Domain: Range:

Asymptotes

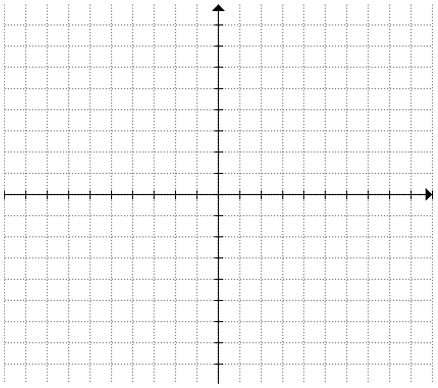
b) $y=\log(x-2)+1$



Domain: Range:

Asymptotes

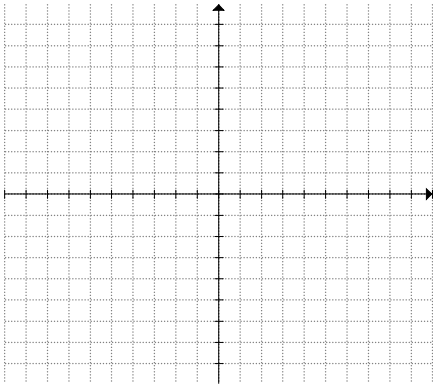
c) $x^2-(y+1)^2=9$



Domain: Range:

Asymptotes

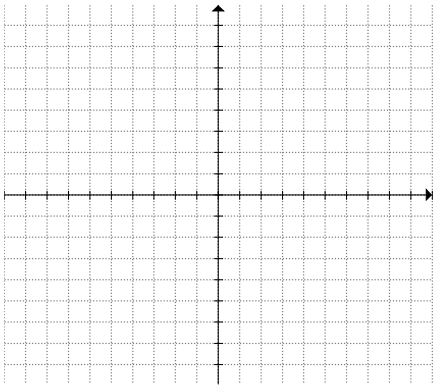
d) $y=2(3^x)-4$



Domain: Range:

Asymptotes

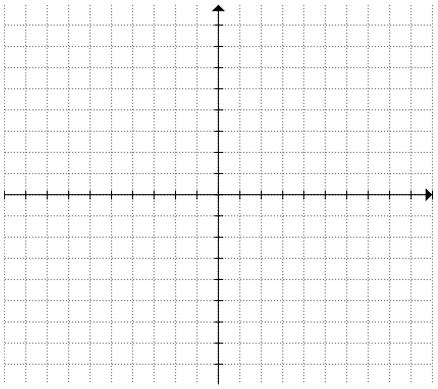
e) $x^2+6x-y^2+2x=0$



Domain: Range:

Asymptotes

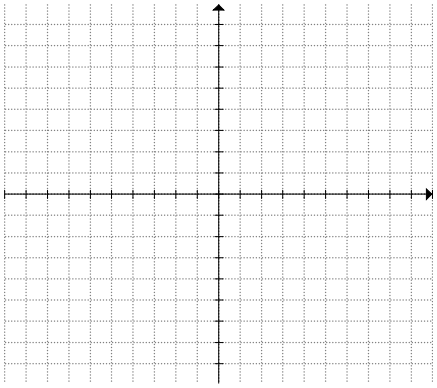
f) $y=2\log(7-2x)$



Domain: Range:

Asymptotes

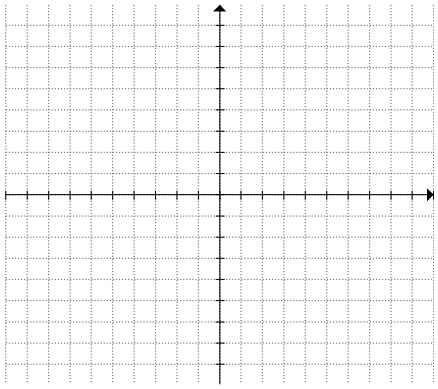
g) $y=2^{x+1}$



Domain: Range:

y-intercept

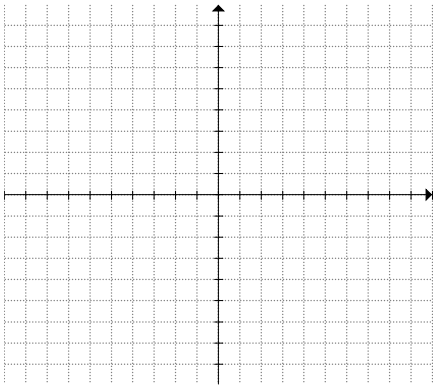
h) $y=-2(3)^{-x}+1$



Domain: Range:

y-intercept

i) $y=-5(1.5)^{x-3}$



Domain: Range:

y-intercept

6. Given the functions $f(x)=2x^2+6x+11$ and $g(x)=0.5(x-3)(2x+4)(8-3x)$, find the equation for each of the following:

i) $f(8x)$ ii) $g(2x-1)$ iii) $f(2+z^2)-10$

iv) What is the domain of $\frac{1}{g(x+1)}$?

vi) What is the range of $\frac{1}{f(x+2)}$?

7. Solve for "k" : $2(4)^x = k(0.25)^{x+2}$

8. What is the center and radius of the following circle: $x^2-4x+y^2-6x+2=0$

9. What are the x-intercept(s) of the function: $y=x^3-6x^2+12x-20$

10. If the smallest value of "y" satisfying the equation $y=3x^2+6x+k$ is 4, find the value of "k"?

11. For what values of "k" is there no solution? $\left(-\frac{2}{7}\right)2^{3x+4}+4=k$

12. Solve for "c" in terms of "a" and "b" given that: $\sqrt{a+\frac{b}{c}}=a\sqrt{\frac{b}{c}}$

13. Let $f(x)=a^2x^2+5ax+3$ and $f(2)=2$. Find all possible values of the constant "a"

14. A function "f" satisfies the equation $f(x)+f(x+3)=2x+5$ for all values of "x". If $f(8)+f(2)=12$, then determine the value of f(5). [CSMC]

15. For any real numbre "x', $\lfloor x \rfloor$ denotes the largest integer less than or equal to "x". For example $\lfloor 4.1 \rfloor = 4$ and $\lfloor -3.8 \rfloor = -4$. That is, $\lfloor x \rfloor$ is the integer that satisfies the inequality $\lfloor x \rfloor \leq x < \lfloor x \rfloor + 1$.

    a) The equation $x^2 = 3\lfloor x \rfloor + 1$ has two solutions. One solution is $x = \sqrt{7}$. The second solution is of the form $x = \sqrt{a}$ for some positive integer "a". Determine the value of "a".

    b) For each positive integer "n", determine all possible integer values of the expression $x^2 - 3\lfloor x \rfloor$, where 'x" is a real number with $\lfloor x \rfloor = n$

    c) For each integer "k" with $k \geq 0$, determine all real numbers "x" for which $x^2 = 3\lfloor x \rfloor + (k^2 - 1)$