Problem Set **Name ANSWERS KEY**
Due January 23rd

All Work must be shown for credit!!!
This will count as a GRADE. You are expected to do this on your own without a CALCULATOR.
This should give you an idea of your preparedness for this course! (3 pts. each)

1. Write the equation of $f(x) = 2x^2 - 8x + 5$ right 7 units and up 3 units. $y = 2(x-9)^2$

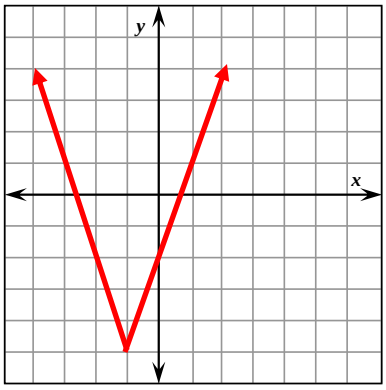
2. The equation $y = -[4x + 10]$ describes a function that is translated from a parent function. 2. horiz comp by 1/4

   a. Describe each of the translations with specific values: (i.e down 5 units) 2. left 2.5

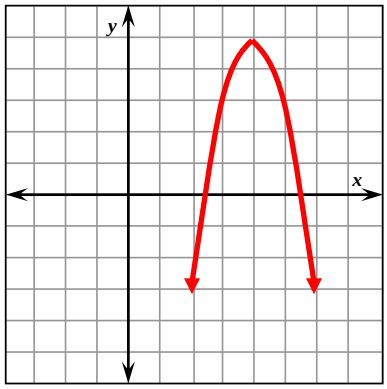
   2. reflected over x-axis

Graph the following equations without using a calculator. (Transformations help!)

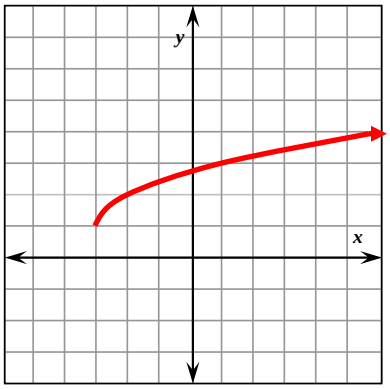
3. $y = 3|x + 1| - 5$



4. $y = -2(x - 4)^2 + 5$



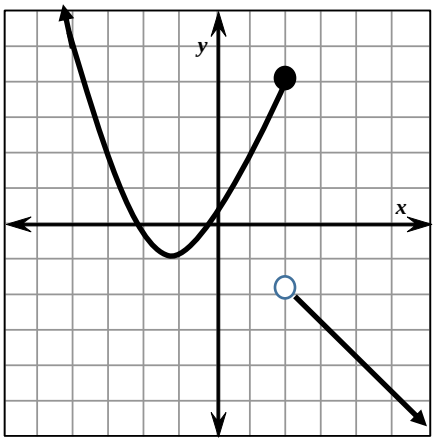
5. $y = \sqrt{x+3} + 1$



3. 6. If $\frac{ab}{c} + d = e$, then what does *bc* equal? $bc = \frac{ab^2}{e-d}$ or $\frac{ec^2 - dc^2}{a}$
   (Think, you can't isolate bc)

7. If $12 - 6(x^3 + y^3) = 48$, what is $(x^3 + y^3)^2 = ?$ $(x^3 + y^3)^2 = ?$ 36

8. Find the domain and range of the relation and determine whether it is a function.



Use Interval Notation (Parentheses & Brackets)

Domain: $(-\infty, \infty)$

Range: $(-\infty, -2) \cup [-1, \infty)$

Function(yes or no) yes

Factor each of the following completely. DO NOT SOLVE!

9. $x^3 + 64$ — $(x + 4)(x^2 - 4x + 16)$

10. $25x^2 + 30x + 9$ — $(5x + 3)(5x + 3)$

11. $x^4 - 45x^2 + 324$ — $(x - 6)(x + 6)(x - 3)(x + 3)$

12. $24x^3 - x^2 - 3x$ — $(x)(3x + 1)(8x - 3)$

13. The width of a large square is 5x + 2 and the perimeter of a small square is 4x – 8.
Find the difference between the areas of the two squares. Difference $24x^2 + 24x$

14. $-2x^4 - 5x^3 + 9x - 1$ is divided by x + 2. What is the remainder? -11

Solve each of the following equations without a calculator. (Quadratic Formula needs to be simplified, if used)

15. $50x^2 = 72$ — $x = \pm\frac{6}{5}$

16. $x^2 + 6x + 6 = 0$ — $x = -3 \pm \sqrt{3}$

17. $\tan\frac{5\pi}{6} = x$ — $x = \frac{-\sqrt{3}}{3}$

18. When solving $-4x^2 - 21x - 3 = 0$, what is the sum of the roots? -21/ 4

19. The function $y = -16t^2 + 450$ models the height *y* in feet of a stone *t* seconds after it is dropped from the edge of a vertical cliff. How long will it take the stone to hit the ground? Round to the nearest tenth.
(Use a graphing calculator)
5.3 secs

20. Find the missing value to complete the square. $x^2 + 3x +$ 9/ 4

21. Find all zeros of $2x^4 - 5x^3 + 53x^2 - 125x + 75 = 0$.
Zeros: x = 1, x = 1.5, $x = \pm 5i$

22. Write a polynomial function in standard form with zeros at -2 and $5 - 3i$. **$y = x^3 - 8x^2 + 14x + 68$**

23. If $f(x) = \frac{12x^2 + 5x - 2}{9x^2 - 4}$ find the following

23. Hole: (-2/3 , 11/12)

Vertical Asymptote **x = 2/3**

Horizontal Asymptote **y = 4/3**

x- intercept (1/4 , 0)

Evaluate the following:

24. $\log_{27}\frac{1}{243} = x$ — **x = -5 /3**

25. $\log_{16}x = \frac{3}{4}$ — **x = 8**

26. $\log_2(x^2 + 8) = \log_2 x + \log_2 6$ — **x = 2, x = 4**