Name:_____

Welcome to **AP Precalculus**. This summer assignment is designed to help you make sure you are ready. **This will be officially assigned the first day of school and will be due on Friday August 7th**.
You may work on it over the summer and make changes during the first week of school. We will have an assessment that includes these skills, on Friday, August 7th.

We will work hard this year, but the result will be worth your effort. I want you to be prepared, not worried—we've got this! Over 60% of the AP Exam must be completed without a calculator and, for that reason, many of our tests will be done without a calculator. **This practice should be done without a calculator**.
Speaking of calculators, you may either use a TI-84/TI-84 CE graphing calculator or the online Desmos Graphing Calculator for class this year. I will teach the skills that we learn on both types of calculators. If you plan on advancing to upper math in the future, this would be a great class in which to learn how to use the TI-84 calculator.

1. **Simplify the following radicals.**
   $\sqrt{36}$ $\sqrt{48}$ $2\sqrt{12}$ $-4\sqrt{27}$

2. **Polynomial Operations**
   Write each sum or difference as a polynomial in standard form (remember to distribute the negative for subtraction)

$\left(3x^4+12x^3-2x^2\right)+\left(5x^4-x^3+7x^2\right)$ $\left(-7n^4+24n^5-3n^2+9\right)-\left(6n^4+2n^5+n+1\right)$

$\left(4k^4+3k^3-9k^2-7\right)-\left(3k^5-4k^2+2k^3\right)$ $\left(5r^3-2r^2-3r+7\right)+\left(5r^3+r^2+9\right)-\left(2r^3+3r^2-2r-7\right)$

Find each Product:
$(5x+4)(2x-7)$ $(2x+1)\left(x^2-4x-3\right)$

$(-4b-2)\left(b^2-3b+7\right)$ $2a^2\left(-8a^3-14a^2+6a\right)$

3. Solve the following equations for the variable.

$5 = \frac{a}{7} + 1$ $\frac{d+4}{5} = -6$ $2(x-3) = -5$

$2x - 3 = -x + 6$ $-4(3r-1) + 24 = 2r$

4. Factor the following. Remember to check for a GCF first!

$2x^3 - 4x^2 - 6x$ $10x^2 + 24x$ $8h^2 + 18h - 5$

5. Solve by factoring. Be sure to show your factors before solving ☺.

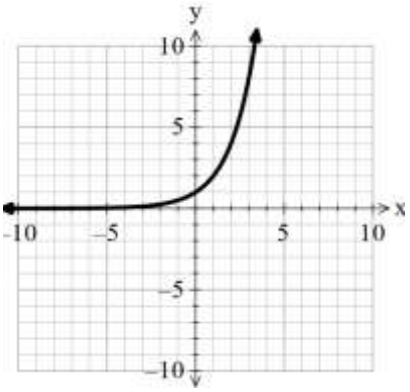
$6x^2 = x + 12$ $2x^2 - 4x = 30$ $2b^2 = 14b$

$r^2 = -20r - 100$ $16x^2 - 25 = 0$ $5h^2 - 42h + 16 = 0$

6. Simplify the following using exponent rules.

$y^{\frac{2}{3}} \cdot y^{\frac{4}{5}}$ $\quad \frac{p^3}{p^5}$ $\quad (r^{\frac{4}{3}})^6$ $\quad x^{-2} \cdot z^3 \cdot x^{-4}$ $\quad (x^2 z^3)^3 \cdot z^{-4}$

7. Find the following using the graph, equation and table below. Remember f^{-1} means inverse of f which means the value inside the parentheses represents a y-value instead of an x-value on the original function f.



Graph of f

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

x	h(x)
-2	6
-1	5
0	4
2	3
3	2

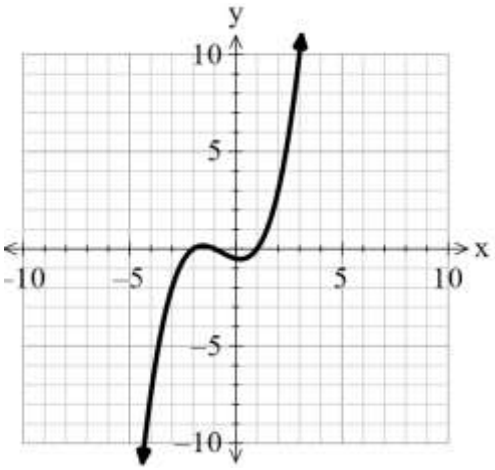
$f(2) =$ $\quad f^{-1}(2) =$ $\quad g(2) =$ $\quad h(2) =$ $\quad h^{-1}(2) =$

8. Find the average rate of change for the given functions. Remember AROC is just slope! $\frac{y_2 - y_1}{x_2 - x_1}$

a. $f(x) = x^2 - 3x + 2$ over the interval $[-2, 0]$

b. Find the average rate of change between these two points $\left(\frac{1}{2}, -\frac{2}{3}\right), \left(-\frac{3}{4}, \frac{5}{6}\right)$.

c. Find the average rate of change over the interval $-3 \le x \le 2$.



Graph of g

9. Point slope form is an alternate form of a linear equation that looks like $y - y_1 = m(x - x_1)$. Use the following points to find the slope and write the equation of the linear line between them in point slope form.

Ex: (1, 2) and (4,4). Slope between them is 2/3, so the linear line in point slope form would be $y - 2 = \frac{2}{3}(x - 1)$.

a. $(-2,5),(-1,6)$

b. $\left(\frac{4}{5},\frac{2}{3}\right),\left(\frac{1}{10},-\frac{4}{3}\right)$