Required Math Summer Review Homework
Honors Precalculus

Please print off this worksheet, complete the problems, and bring them with you to the first day of class.

**Part I: No Calculators and Show All Work.**   **Name: _____**

1) Find the equation of the line that passes through the points (-3, 7) and (5, -3). Write your answer in **slope-intercept form.**

2) Find the equation of the line that is perpendicular to the line in #1 and passes through the point (4, 1). Write your answer in **point-slope form.**

3) Solve for P in terms of Q: $6Q - 7P = P - Q + 11$

4) Shade the solution to the following inequality: $5x - 2y > 10$. Be sure to label your scale.
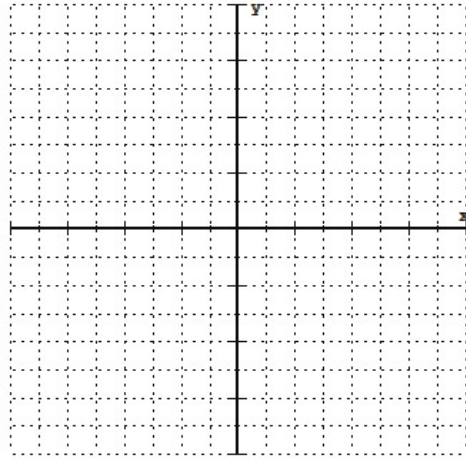
5) Factor each of the following completely:

a) $4x^5 - 9x^3 + 4x^2 - 9$

b) $\pi r^2 + 2\pi rh$

6) Find the domain and range of the following functions. Write your answer in **interval notation**.

a) $f(x) = |x - 8| + 1$

b) $g(x) = 5e^{0.02x}$

c) $h(x) = -3\sqrt{x+2} + 4$

7) Given $f(x)=2x^2-4$.

a) Evaluate f(-5).

b) Simplify f(1 - x).

8) Simplify the following: $\dfrac{2x-2}{5x+2} \div \dfrac{x-1}{x}$

9) Solve the following equations. Round to three decimal places where necessary.

a) $2(x+3)^2-8=0$ (Solve <u>without</u> squaring the binomial first.)
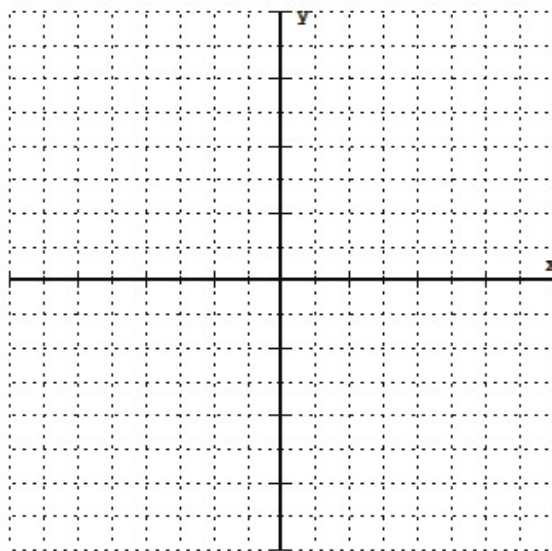
b) $\dfrac{2}{x-1}+\dfrac{3}{x+5}=8$

c) $3\sqrt{x-8}=5$

10) Refer to the following quadratic function: $f(x) = 2x^2 - 12x + 10$.

a) Find the equation for the axis of symmetry and the coordinates of the vertex.

b) Find the x- and y-intercepts algebraically.

c) State the domain and range of this function.

d) Sketch the graph on the axes below. Plot at least five nice points. Clearly label your scale.

11) Find the zeros of the following quadratic functions <u>algebraically</u>. Leave your answer as exact.
   Note: your answers might be non-real.

a) $f(x)=x^2+5x-9$

b) $g(x)=3x^2+x+2$

12) How much 10% solution and how much 45% solution should be mixed together to make 100 gallons of 25% solution? Be sure to set up and solve a system of linear equations to model this situation.

13) Simplify the following leaving no negative exponents.

a) $\left(x^{1/3}y^{-5/3}\right)^{-3}$

b) $\dfrac{12x^2z^{-3}y}{(2x^3zy^{-1})^{-2}}$

14) Refer to the following function: $g(x) = -x^3 + 4x^2 + 31x - 70$. Use your graphing calculator's
     features to answer each of the following.

a) Find the zeros (*x*-intercepts) of the graph of this function.

b) Find the coordinates (*x* and *y*) of any turning points on the graph (local maximum and/or minimum
   values). Round your answer to three decimal places.

15) Jose's paint crew knows from experience that its 18 foot ladder is particularly stable when the
     distance from the ground to the top of the ladder is 5 feet more than the distance from the building
     to the base of the ladder.

a) How far up the building does the ladder reach?

b) Using right triangle trigonometry, find the measure of the angle that the ladder makes with the
   ground.

16) Ralph buys a car for $50,000. Its value depreciates at a continuous rate of 9% per year.

a) Write an equation for the value of the sports car $V(t)$ after t years.

b) Evaluate $V(7)$ and interpret your answer in the context of the problem. You should write complete sentences with numbers and units for your interpretation.

c) Evaluate $V^{-1}(20{,}328.48)$ and interpret your answer in the context of the problem. You should write complete sentences with numbers and units for your interpretation.

17) A bank account with $20,000 receives 1.25% interest per year compounded monthly. What is the value of the account after 8 years?

18) A bacteria colony grows at a continuous rate of 3.2% every hour. Find the doubling time of the bacteria to the nearest minute.

19) Solve each of the following equations for *x* **exactly**. Then give a three-decimal approximation.

a) $5(2)^{x-4}-8=7$

b) $\log_4(2x-3)+5=7$

c) $\log_2(x+3)-\log_2(2x-1)=3$