The Williston Northampton School

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.

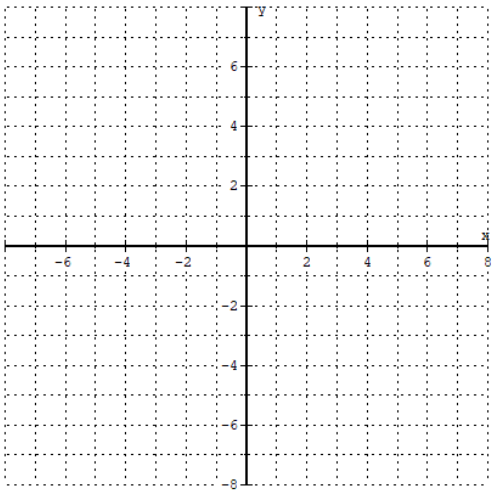
Part I: No Calculators and Show All Work. **Name: _____**

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 set to the following inequality: $-2x+6y>12$.



5) Factor each of the following completely:

a) $2x^5-8x^3-2x^2+8$

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

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

a) $f(x)=-2|x+4|-5$

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

c) $h(x)=2\sqrt{x-3}-7$

7) Given $f(x) = -3x^2 + 2$.

a) Evaluate $f(-2)$.

b) Evaluate and simplify $f(2 + x)$.

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

9) Solve the following equations for x **exactly**.

a) $-3(x-2)^2 + 5 = 0$ (Solve <u>without</u> squaring the binomial.)

b) $\dfrac{2}{x-1} + \dfrac{3}{x+5} = 1$

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

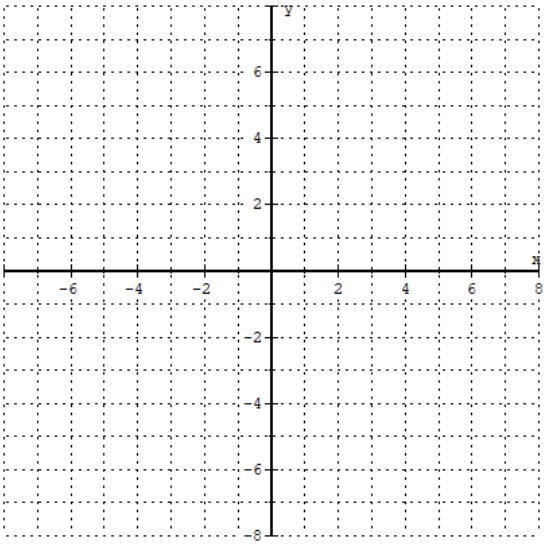
10) Refer to the following quadratic function: $f(x)=2x^2-12x+10$.

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.



11) Solve the following equation **exactly** over the complex number system. (Leave your answer in terms of *i.*)

$$-2x^2+3x-3=0$$

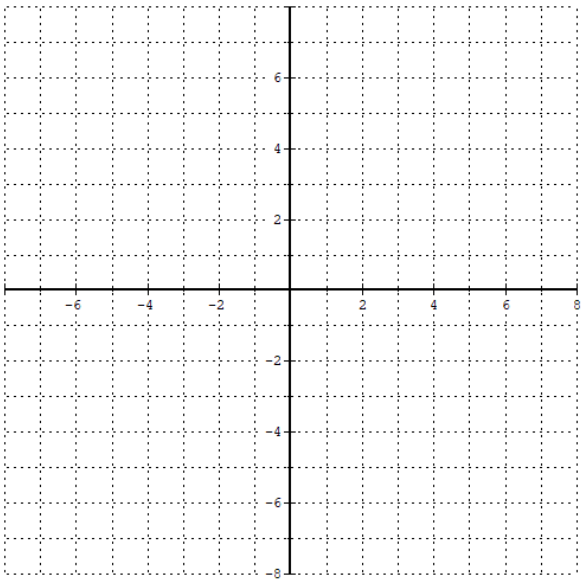
12) Find both the *x* and *y* intercepts of each of the following **exactly**. (Be sure to write them as points!)

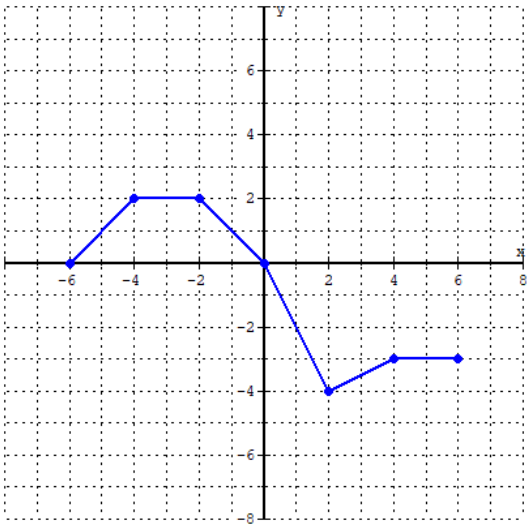
a) $y=-3(x+2)^3+6$

b) $y=-4(0.5)^{x+1}+12$

13) Graph the following piecewise defined function accurately.

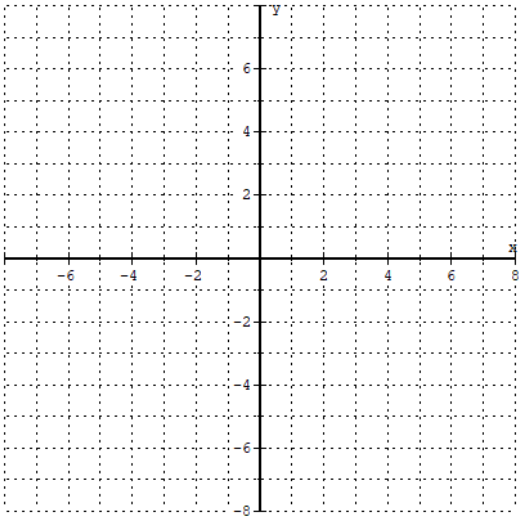
$$f(x)=\begin{cases} x+6 & -7\le x<-2 \\ 2x^2-5 & -2\le x<2 \\ 2x-1 & 2\le x<6 \end{cases}$$



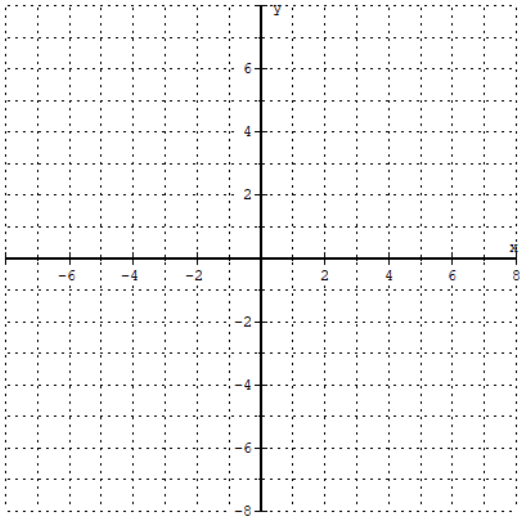


14) Given $f(x)$ in the graph above, graph each of the following accurately.

a) $g(x)=-2f(x+1)-2$



b) $h(x)=f(-x)+4$



Part II: With Calculators and show all work.
Round all your answers to three decimal places!

15) 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.

16) Ralph buys a car for $62,000. Its value depreciates at an annual rate of 7.25%.

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

b) Evaluate $V(9)$ and interpret your answer in the context of the problem. You should write complete sentences with numbers and units for your interpretation.

c) Evaluate $V^{-1}(20{,}049.36)$ and interpret your answer in the context of the problem. You should write complete sentences with numbers and units for your interpretation.

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

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

a) $-4(3)^{x+2}+9=3$

b) $5\log_6(3x+2)-5=10$

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