

Math 180
Spring 2010

Name _____

Homework #1

Due Monday, March 1

No late papers accepted! No exceptions!

1. Let $f(x) = -x^2 + 3x - 4$. Evaluate and simplify $\frac{f(x+h) - f(x)}{h}$.

2. Find an equation of the line through $(-1, -2)$ and perpendicular to the line $3x - 4y = 12$. Graph both lines.

3. Simplify by factoring:
$$\frac{(x^2 + 4)^{\frac{1}{2}}(2x) - x^2\left(\frac{1}{2}\right)(x^2 + 4)^{-\frac{1}{2}}(2x)}{x^2 + 4}$$

4. An employee has two options for positions in a large corporation. One position pays \$12.50 per hour plus an additional unit rate of \$0.75 per unit produced. The other pays \$9.20 per hour plus a unit rate of \$1.30.
- Find linear equations for the hourly wages W in terms of x , the number of units produced per hour, for each of the options.
 - Graph both equations and find the intersection point.
 - Interpret the intersection point in the graph. How would you use this information to select the correct option if the goal were to obtain the highest wage.

5. You have a piece of wire that is 10 meters long. You want to cut the wire into two pieces. You want to use one piece to make a circle and the second piece to make an equilateral triangle. Find a function that represents the total area of the two figures with respect to x , the point where the wire is cut.

6. Solve the equation: $\sin(3x) = \cos(3x)$ where x is defined to be in the interval $[0, 2\pi]$.