MAT 201
Assignment 2
Thursday, February 5, 2015

For full credit on these problems, each must be submitted with a complete and clear solution, showing all of your work. You may work with other classmates on these problems, but please indicate on your assignment if you received help. Partial answers and incomplete solutions may be eligible for some partial credit, depending on the level of completeness and demonstrated understanding.

1. Consider the line given by $3x + 4y = 15$ and the point $P = (2, -1)$. Find the equation of the line passing the point P that is

    (a) parallel to the line

    (b) perpendicular to the line

2. Find an equation of the line tangent to the circle $x^2 + y^2 = 169$ at the point $(5, 12)$.

3. For the functions $f(x) = x^2 - 2$ and $g(x) = 4x + 1$, find

    (a) $f(x) + g(x)$

    (b) $f(x) \cdot g(x)$

    (c) $f \circ g(x)$

    (d) $g \circ f(x)$

    (e) $f(x + h)$

    (f) $\frac{f(x+h) - f(x)}{h}$

4. Find the domain of the following functions

    (a) $f(x) = \frac{1}{x^2 + 7x + 10}$

    (b) $f(x) = \sqrt{x^3 + 7x^2 + 12x}$

    (c) $f(x) = \csc x$

5. An open box is to be made from a piece of cardboard 14 centimeters by 20 centimeters by cutting equal squares from the corners and turning up the sides.

    (a) Write the volume of the box V as a function of x, the length of the corner squares.

    (b) What is the domain of the function $V(x)$?

    (c) Plot the function $V(x)$.