MATH 150 Pre-Calculus, Week In Review

Fall, 2014, Problem Set 4 (3A-4A)

JoungDong Kim

1. Prove that the triangle with vertices $A(-3,-2)$, $B(-2,2)$, and $C(6,0)$ is a right triangle.

2. Write an equation that describes all the points (x, y) that are 5 units from point $B(6, 0)$.

3. If $(-7, 2)$ and $(5, 8)$ are endpoints of a diameter of a circle, write the circle equation.

4. Find the center and radius for the following circles.

(a) $(x-3)^2 + (y-7)^2 = 16$

(b) $(x+\frac{1}{2})^2 + (y+5)^2 = 17$

(c) $x^2 + y^2 + 8x + 4 = 0$

(d) $2x^2 + 2y^2 - 8x + 20y - 2 = 0$

5. Graph $y = 3x - 2$.

6. Graph $y = |x - 2|$.

7. Graph $y = -x^3$.

8. Graph $xy = 1$.

9. Find the intercepts for $|x| - y = 2$.

10. Find the intercepts for $x^2 + 4x - 2xy = y + 5$.

11. Test the equation for symmetry about the x-axis, y-axis, or origin.

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

(b) $xy = x|x^2 - 1|$

12. Find the slope of the line through each pair of points, and determine whether each line is increasing, decreasing, horizontal or vertical.

(a) $A(-2, 1)$ and $B(3, 5)$

(b) $C(0, -3)$ and $D(-4, 1)$

(c) $E(3, 5)$ and $F(3, -5)$

(d) $G(0, -2)$ and $H(3, -2)$

13. If the line through $(1, 5)$ and $(6, y_2)$ is parallel to the line $3x - 5y = 10$, find y_2.

14. Write an equation for each of following lines.

(a) Line through $(0, -1)$ that is parallel to $3x + y = 2$.

(b) Line through $(0, 3)$ that is perpendicular to $y = -\frac{3}{4}x + 1$.

(c) Line through $(5, 2)$ that is perpendicular to $2x - y = 5$.

15. Write an equation for the perpendicular bisector of the line segment connecting $A(-4, 1)$ and $B(6, 5)$.

16. For $f(x) = 4x - 3$, evaluate $\dfrac{f(a+h) - f(a)}{h}$.

17. For $f(x) = 3x^2 - 2x - 1$, evaluate $\dfrac{f(a+h) - f(a)}{h}$.