Notesheet. Sections 1.3 and 2.1

Math 1210

Definition 1. A <u>set</u> is

Definition 2. <u>function</u> is

Definition 3. (<u>domain</u>, <u>range</u>)

Challenge 4. Let f be the function defined by $f(x) = 6x^2 - 8$. What is $f(3)$? What is $f(a + b)$? What is the range of f when the domain is $\mathbb{R}$?

Definition 5. What is the Cartesian coordinate system, origin, x-axis, y-axis, ordered pair, x-coordinate, y-coordinate, Quadrants I, II, III, and IV?

Definition 6 (Pythagorean theorem)**.**

Definition 7 (Distance formula)**.**

Challenge 8. Find the distance between the points $(3, 2)$ and $(8, -10)$.

Challenge 9. Let C be a circle with center $(1, 4)$ and radius 7. Write an equation that defines all points (x, y) that lie on the boundary of the circle. (Note that every point on the boundary of the circle must satisfy this equation.)

Challenge 10. Consider a straight shoreline with a station S at point $(8{,}000, 0)$ and a cable that runs to point $Q = (2{,}000, 0)$ (on land) and then runs underwater to point $M = (0, 5{,}000)$. Cable on land costs \$3 per foot and underwater costs \$6 per foot. What is the cost of the cable? (Useful fact: $\sqrt{29} \approx 5.385$.)