# Average Rate of change and Function Classes

1. Draw a Venn diagram of the following Sets of functions:

    (a) Constant

    (b) Linear

    (c) Power

    (d) Polynomial

    (e) Rational

    (f) Algebraic

    (g) Exponential

2. Suppose we have a function defined on the interval from $-1$ to $6$. If we know that the average rate of change of $f$ on the interval from $-1$ to $1$ is $5$, and the average rate of change of $f$ on the interval from $1$ to $6$ is $-3$, what is the average rate of change of $f$ on the on the interval $-1$ to $6$?

3. Suppose we have a function defined on the interval from $a$ to $b$, and let $c$ be a number such that $a < c < b$. If we know that the average rate of change of $f$ on the interval from $a$ to $c$ is $3$, and the average rate of change of $f$ on the interval from $c$ to $b$ is $2$, what is the average rate of change of $f$ on the on the interval $a$ to $b$? (**Hint: Your answer will be in terms of** $a, b,$ **and** $c$)

4. Suppose we have a function defined on the interval from $a$ to $b$, and let $c$ be a number such that $a < c < b$. If we know that the average rate of change of $f$ on the interval from $a$ to $c$ is $r_1$, and the average rate of change of $f$ on the interval from $c$ to $b$ is $r_2$, what is the average rate of change of $f$ on the on the interval $a$ to $b$? (**Hint: Consider the quantities you know (i.e.** $a, b, c, r_1,$ **and** $r_2$) **and use the formula to solve for the one you don't.**)