1. A train leaves city A at 10:00 a.m. and arrives at city B at 12:15 p.m. The train leaves city B at 2:00 p.m. and arrives at city C three hours later. The average velocity of the train while traveling from A to B was 45 miles per hour. The distance between city B and city C is 240 miles. What is the average velocity of the train from city A to city C (including the stop)?

2. A train leaves city A at 8:00 a.m. and arrives at city B at 10:00 a.m. The average velocity of the train from A to B was 60 miles per hour. The train leaves city B at 10:00 a.m. and arrives at city C at 1:00 p.m. Find the average velocity of the train from city B to C, given that the average velocity from A to C was 50 miles per hour.

3. Let $f(x) = \dfrac{3}{x^2 + 1}$.

   a. Find the average rate of change of $f(x)$ from $x = 0$ to $x = 2$.

   b. Draw the graph of $y = f(x)$ (a graphing calculator can help). Show how to represent your answer to part (a) on the graph.

4. Find a positive number A so that the average rate of change of $g(x) = 3x^2 - 1$ from $x = 2$ to $x = A$ is equal to 33.