Name: _____   Date: _____
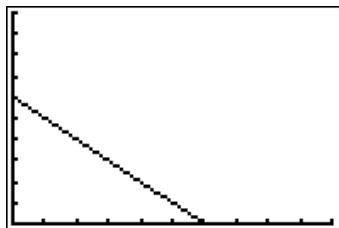
1.5 Slopes of Secants and Average Rate of Change

1. Identify whether the average rate of change for pairs of points along each graph is constant and positive, constant and negative, zero or non-constant. Justify your response.
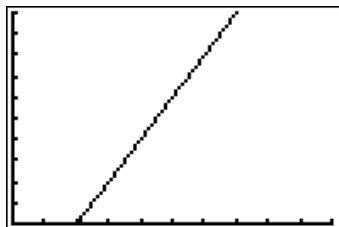Window variables for all three graphs: $x \in [0, 10]$, $y \in [0, 10]$.
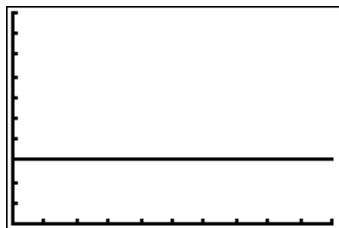
a)

b)

c)

2. Determine the average rate of change for two points on each line segment in question 1.

3. The cost, C, of making one unit of a product at any time x, in years, can be modelled by the function
$C(x) = 4500 + 1530x - 0.04x^3$,
$x \in [0, 200]$.
a) Determine algebraically the average rate of change of the cost from
  i) year 0 to year 4
  ii) year 4 to year 7
  iii) year 7 to year 9
b) Interpret your answers from part a).

4. If a ball is dropped from the top of a 120-m cliff, its height, h, in metres, after t seconds can be modelled by
$h(t) = 120 - 4.9t^2$.
a) Find the average rate of change of the height of the ball with respect to time over the intervals
  i) 1 s to 4 s
  ii) 4 s to 6 s
  iii) 6 s to 7 s
b) What does the average rate of change represent in this situation?
c) Interpret the significance of your answers in part a).

5. A census is taken of the permanent population, P, of Collingwood, Ontario every five years.

Year	Population
1991	13 500
1996	15 596
2001	16 039
2006	17 290

a) Determine the average rate of change of the population for
  i) 1991 to 1996
  ii) 1996 to 2001
  iii) 2001 to 2006
  iv) the entire fifteen-year period
b) What factors do you think might have led to the varied results?