

Written Assignment 2

Due Wednesday, July 6th

1. A cat starts running with a speed of 2.6 meters per second, and over the next 5 seconds the cat slows down to walk at 0.3 seconds.
 - (a) What is the average rate of change of the cat's speed? Interpret your answer.
 - (b) What is the percent change of the cat's speed? Interpret your answer.
 - (c) How do these quantities differ? How are they the same? [List at least one similarity and one difference.]

2. A construction company is building a canal, and someone suggests they use the shape of a parabola given by the equation

$$h = \frac{1}{50}x^2 - 2x,$$

where h is the height in feet (above or below ground level) and x is the distance from one of the sides of the canal, in feet.

- (a) How deep is the canal?
 - (b) Assuming one of the sides is at $x = 0$, where is the other side? (In other words, how wide is the canal?)
3. Minus signs are important!
 - (a) Find the discriminant of the function $Q(x) = 4x^2 - 9x + 7$. Based on this, how many roots should Q have?
 - (b) Find the discriminant of the function $Q(x) = 4x^2 - 9x - 7$. Based on this, how many roots should Q have?
 - (c) (Extra Credit) Explain the difference in your answers to part (a) and (b) graphically. Why does changing the minus sign affect the number of solutions?