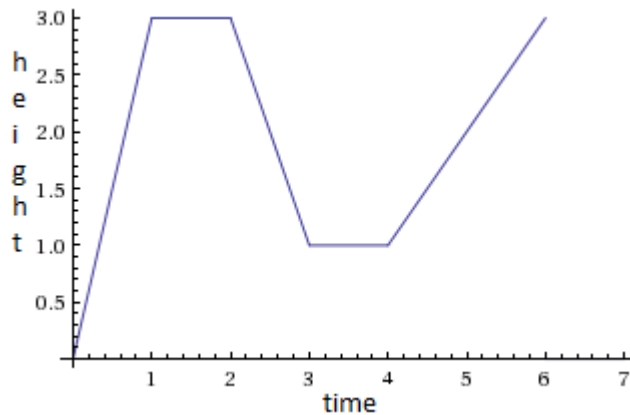


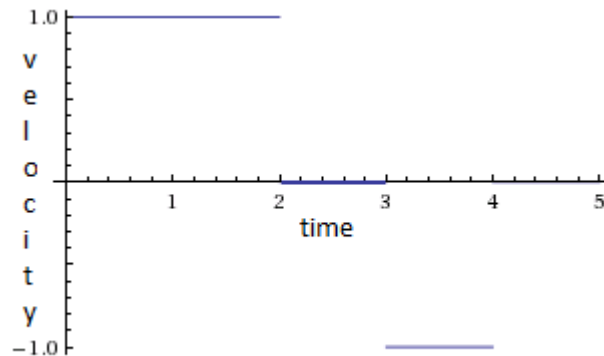
MATH 1 Homework 6

Assigned October 19th, due October 26th

- Use the limit definition to find the slope of the tangent line to $f(x) = x - x^2$ at the point $(1, 0)$.
 - Find an equation of the tangent line at the point $(1, 0)$.
 - Graph both $f(x)$ and the tangent line at the point $(1, 0)$. Be sure to label which is which.
- Use the limit definition to find the derivative of $f(x) = x^2 - 4x$.
 - Check your work using the power rule.
 - Graph f and f' (label which is which). Why does it make sense that f' is positive, negative, and zero for the x values that it is (when compared to the graph of f)?
- A particle starts by moving up along a vertical line; the graph below is of the height of the particle relative to time. When is the particle moving up? Down? Standing still?



- Draw a graph of the velocity of the particle relative to time.
- A second particle starts by moving up along a vertical line; the graph of its velocity relative to time is shown below. When is the particle moving up? Down? Standing still?



- Draw a graph of the height of the particle relative to time.

4. Draw a graph of a function that has the following properties on the interval $[0, 1]$:
- (a) positive with positive derivative.
 - (b) negative with positive derivative.
 - (c) positive with negative derivative.
 - (d) negative with negative derivative.
5. Compute the following derivatives using the rules for computing derivatives. Show your work.
- (a) $g'(3)$ for $g(x) = 3$
 - (b) $h'(-1)$ for $h(x) = 6e^x + x(x - 1)$
 - (c) $j'(0)$ for $j(x) = 3x^6 + x^2 + x - 5e^x$
 - (d) $k'(-2)$ for $k(x) = x^3 - 3x + 5$