Homework 3
Graded Problems
M170-004

• Show all your work.

• Regardless of your prior experience with calculus, you must use limit methods for all derivatives on these problems.

1. (10 pts.) Find $f'(-1)$ for the function $f(x) = \sqrt{x + 3}$

2. (10 pts.) Find $f'(a)$ for the function $f(x) = x^3 - x^2$

3. (10 pts.) An object is launched into the air so that after $t$ seconds its height above ground is $h(t) = 48t - 16t^2$ feet. At what time is its velocity exactly $-8$ feet/min?

4. (10 pts.) The graph of $f(x) = \frac{1}{x}$ has a tangent line that passes through $(0, 1.5)$ as shown at right. Where is the point of tangency? Give $x$- and $y$-coordinates.