Reading Outline, §2.2

Vocabulary/Definitions

- Difference quotient
- Average rate of change of f over an interval (with respect to x)
- Absolute change of a function f over an interval
- Instantaneous rate of change of f at $x = a$
- Derivative of f at a
- $f'(a)$ and slopes on the curve $y = f(x)$

Understand

1. The radius, r of a cone of sand with height $h = 5$ cm and a volume V cm^3 is $r = \sqrt{\frac{3V}{5\pi}}$. If the volume of the cone increases from $V = 7$ to $V = 7.15$ (but the height remains constant), what is the average rate of change of the radius?

2. Estimate the derivative $r'(7)$ for the cone above by investigating numerical values for the difference quotient.