

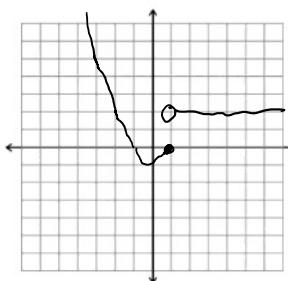
Chapter 1 Review and Section 2.1

1. Consider the following piecewise function.

$$f(x) = \begin{cases} x^2 - 1 & : x \leq 1 \\ 2 & : x > 1 \end{cases}$$

normal parabola translated down 1 unit

Sketch the graph of f below and find $f(-3)$.



It's just a line

domain $(-\infty, \infty)$
range $[-1, \infty)$

2. The height in feet of a ball that is thrown into the air is given by $y = 45t - 16t^2$, where t is time in seconds.

- a) Find the average velocity over the given time intervals.

$$P_1 = (1, h(1))$$

$$\text{slope between two points } i) [1, 1.5]$$

$$P_2 = (1.5, h(1.5))$$

$$\frac{|29 - 31.5|}{|1 - 1.5|} = 5$$

$$S([1, 1.1]) = 11.4$$

$$\frac{\Delta h}{\Delta t}$$

$$iii) [1, 1.01]$$

$$\frac{h(1.01) - h(1)}{1.01 - 1} = 12.84$$

$$iv) [1, 1.001]$$

$$\frac{h(1.001) - h(1)}{1.001 - 1} = 12.984$$

- b) Estimate the instantaneous velocity at $t = 1$.

It's like 13ish