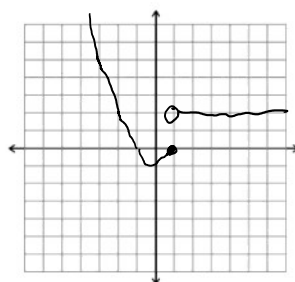


Chapter 1 Review and Section 2.1

1. Consider the following piecewise function.

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

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



normal parabola translated down 1 unit

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.

i) $[1, 1.5]$

$$\frac{h(1.5) - h(1)}{1.5 - 1} = 5$$

ii) $[1, 1.1]$

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

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 13 ish

$P_1 = (1, h(1))$
 $P_2 = (1.5, h(1.5))$
 $\frac{\Delta h}{\Delta t}$

slope between two points

$$h(t) = 45t - 16t^2$$

$$S(P_1) = \frac{h(P_1[1]) - h(P_1[2])}{P_1[1] - P_1[2]}$$