

Chapter 2 Solutions
 MATH 251, CALCULUS I, FALL 2018

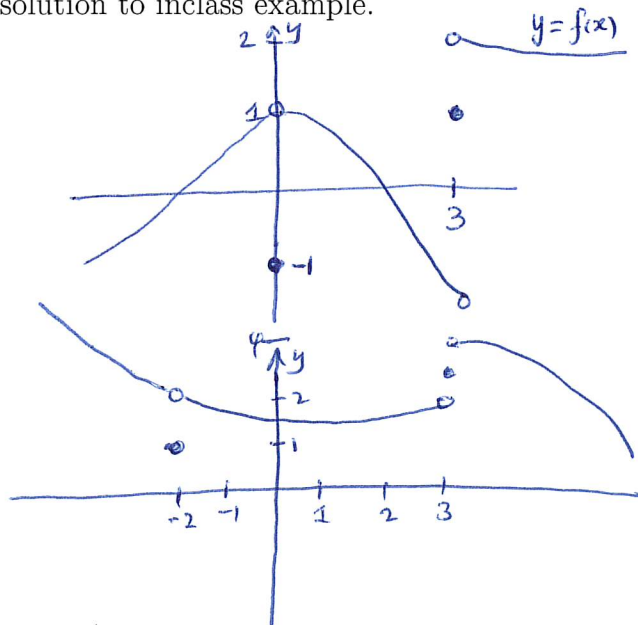
Section 2.1

2. See solution to inclass example.
5. (a). (i) -32 ft/s (ii) -25.6 ft/s (iii) -24.8 ft/s (iv) -24.16 ft/s
 (b). The average velocities approach -24 ft/s, this is an estimate of the instantaneous velocity.
8. (a). (i) -6 cm/s (ii) -4.71 cm/s (iii) -6.13 cm/s (iv) -6.27 cm/s
 (b). The instantaneous velocity appears to be -6.3 cm/s

Section 2.2

2. As x approaches 1 from the left, $f(x)$ approaches 3; and as x approaches 1 from the right, $f(x)$ approaches 7. No, the limit does not exist because the left- and right-hand limits are different
7. (a) $\lim_{t \rightarrow 0^-} g(t) = -1$ (b) $\lim_{t \rightarrow 0^+} g(t) = -2$ (c) $\lim_{t \rightarrow 0} g(t)$ D.N.E because the limits in part (a) and (b) are not equal. (d) $\lim_{t \rightarrow 2^-} g(t) = 2$ (e) $\lim_{t \rightarrow 2^+} g(t) = 0$ (f) $\lim_{t \rightarrow 2} g(t)$ D.N.E because the limits in part (e) and (f) are not equal. $g(2) = 1$ (h) $\lim_{t \rightarrow 4} g(t) = 3$.
8. (a) $\lim_{x \rightarrow 3} A(x) = \infty$ (b) $\lim_{x \rightarrow 2} A(x)$ D.N.E (see parts c and d) (c) $\lim_{x \rightarrow 2^-} A(x) = -\infty$ (d) $\lim_{x \rightarrow 2^+} A(x) = \infty$ (e) $\lim_{x \rightarrow -1} A(x) = \infty$.

10. See solution to inclass example.



$\lim_{x \rightarrow 0} f(x) = 1, \lim_{x \rightarrow 3^-} f(x) = -2$
 $\lim_{x \rightarrow 3^+} f(x) = 2, f(0) = -1, f(3) = 1$

$\lim_{x \rightarrow 3^+} f(x) = 4, \lim_{x \rightarrow 3^-} f(x) = 2$
 $f(3) = 3, f(-2) = 1$

16.

17.

31. $\lim_{x \rightarrow 5^+} \frac{x+1}{x-5} = \infty$ since the numerator is positive and the denominator approaches 0 from the positive side as $x \rightarrow 5^+$.
33. $\lim_{x \rightarrow 1} \frac{2-x}{(x-1)^2} = \infty$ since the numerator is positive and the denominator approaches 0 through positive values as $x \rightarrow 1$.