Chapter 2 REVIEW SHEET -- ANSWERS
Math 180, Vanden Eynden

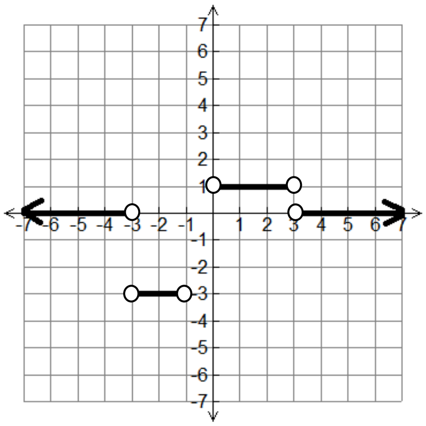
1. a. 0   b. –2   c. 1   d. 1   e. 0   f. x = 0, 4   g. x = 0, 4, 2

2. a. –1/5   b. –1/8   c. 0   d. –1   e. ¾   f. –1/4

   g. Use a table (no algebraic sol) = 0   h. 0   i. Use a table (no algebraic sol) = $-\infty$

   j. 0   k. $-\pi$ l. –5/54

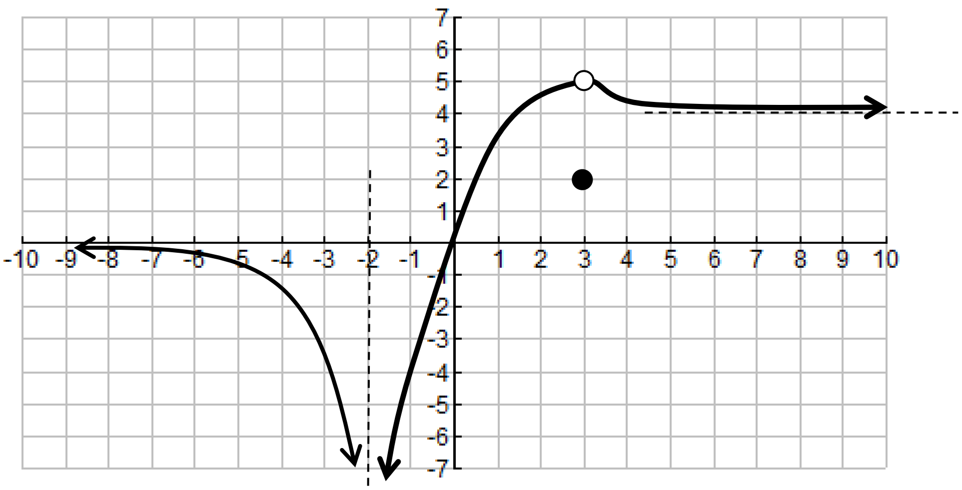
3.



4. a. $g'(x) = \lim_{h\to 0} \dfrac{g(x+h)-g(x)}{h} = \lim_{h\to 0} \dfrac{\frac{3}{x+h} - \frac{3}{x}}{h} = -\dfrac{3}{x^2}$ b. $y = -3x + 6$

5. $a = 2$, $f(x) = x^6$

6.

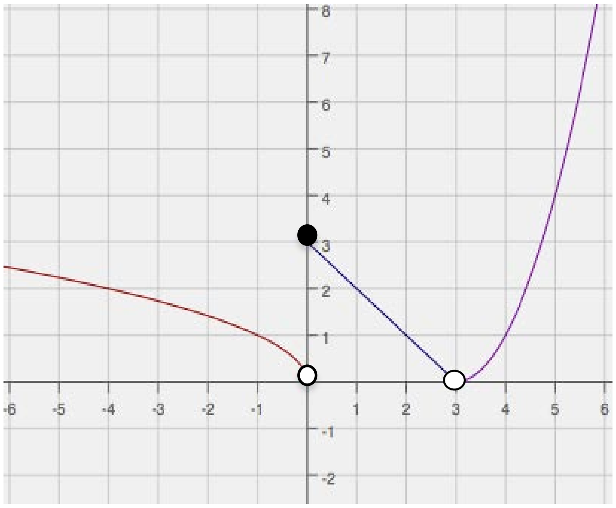


7. a. Use limit definition, $v(a) = \lim_{h\to 0} \dfrac{28(a+h) - 16(a+h)^2 - \left[28a - 16a^2\right]}{h} = 28 - 32a$

   b. $v(1) = -4$ ft/sec   c. $y = 0$ when $t = \dfrac{7}{4} = 1.75$ sec   d. $v(1.75) = -28$ ft/sec

8. Vert: x = –2 Horizontal: y = 0

9.



9a. $\lim_{x \to -4} h(x) =$ 2 $\lim_{x \to 3} h(x) =$ 0 $\lim_{x \to 0^+} h(x) = 3$

$\lim_{x \to 0^-} h(x) =$ 0 $\lim_{x \to 0} h(x) =$ DNE $\lim_{x \to \infty} h(x) = \infty$

9b. x = 0, 3 9c. x = 0, 3

10. Firstly, $f(x)$ is a polynomial and so is continuous for all real *x*. So it is continuous on [–2, –1].

Next, $\left. \begin{array}{l} f(-2) = 2 \\ f(-1) = -4 \end{array} \right\}$ sign change! So by IVT, there exists a zero of $f(x)$ in the given interval [–2, –1]

11. $g'(x) = \lim_{h \to 0} \frac{g(x+h) - g(x)}{h} = \lim_{h \to 0} \frac{\sqrt{x+h} + 1 - \left(\sqrt{x} + 1\right)}{h} = \frac{1}{2\sqrt{x}}$, so slope at *x* = 3 is $g'(3) = \frac{1}{2\sqrt{3}}$,

so equation of line in point-slope form is $y - \left(\sqrt{3} + 1\right) = \frac{1}{2\sqrt{3}}(x - 3)$

12. a. –3 b. 45 c. 25 d. $-\frac{4}{5}$ e. DNE, since denom. = 0 f. –2

13. a. $\frac{89.6}{4} = 22.4$ ft/sec b. $\frac{53.8}{2.4} = 22.42$ ft/sec c. $\frac{35.8}{1.6} = 22.375$ ft/sec

d. Using [1.6, 2.0], we get 25 ft/sec, Using [2.0, 2.4], we get 19.75 ft/sec, the average of the two would give an approximation of the instantaneous velocity at 2.0 sec: 22.375 ft/sec