Chapter 2 Even Answers

Section	Answers
2.1	4) $v_{avg} = 1 \text{ m/sec}$ 6) $v_{avg} = 0 \text{ cm/sec}$ 8) (a) $v_{avg} = 6.3 \text{ m/sec}$; $v_{avg} = 6.03 \text{ m/sec}$; $v_{avg} = 6.003 \text{ m/sec}$ (b) It appears that $v_{INST} = 6 \text{ m/sec}$ 10) (a) $v_{avg} \cong -1.00801 \text{ m/sec}$; $v_{avg} \cong -0.850424 \text{ m/sec}$; $v_{avg} \cong -0.834112 \text{ m/sec}$ (b) You have to try a couple of smaller values of h before seeing a distinct pattern in the v-values. For h = .0001, you'd get $v_{avg} \cong -0.832476 \text{ m/sec}$; h = .00001, $v_{avg} \cong -0.832312 \text{ m/sec}$. Since the average velocity value has settled down to consistently showing $\underline{-0.83}$. . . , we can reasonably conclude that $v_{INST} \cong -0.83 \text{ m/sec}$ 16) Positive slope at A, D; Negative slope at C, F; Greatest positive slope at A; Greatest (in magnitude) negative slope at F; Note: What is the slope at points B and E? (Zero) 18) Curve should be curving upward (a.k.a. "concave up" (like a smile)) 20) $0 < m_C < m_B < m_{\overline{AB}} < 1 < m_A$ 24) (a) 36 feet; (b) 34 ft/sec; (c) 18 ft/sec; (d) 75.0625 ft; v = 0 ft/sec (e) t = 1.5625 sec
2.2	6) The sign on the derivative would be negative. 8) "Estimate" means we can use a table to approximate the derivative by using the average of the right-side and left-side estimates. (We could also set up the limit of the difference quotient then approximate the limit value by substituting values of h that are close to zero. This is the way they approximate the value on Cramster.) Using x = 1.999, 2, 2.001, we'd get f(x) = 8.9901, 9, 9.0100 and $f'(2) \cong \frac{\Delta y}{\Delta x} \cong 9.95$ 10) Label A on any decreasing part of the graph; label B on the bit of the graph below the x-axis; Label C midway between the relative min (valley) and relative max (peak) of the graph; Label D at either of the peaks or at the base of the valley; Label E and F on points where the tangents would be parallel. 12) $f(102) \cong f(100) + f'(100) \cdot \Delta x = 35 + 3 \cdot 2 = \boxed{41}$ (Note: Cramster's solution to this was kind of nuts) 16)(a) $f(4) > f(3)$ because the y-value at x=4 is greater than at x=3 (b) $f(2) - f(1) > f(3) - f(2)$ because Δy from x = 1 to x = 2 is greater than Δy from x = 2 to x = 3 (c) $\frac{f(2) - f(1)}{2 - 1} > \frac{f(3) - f(1)}{3 - 1}$ because slope of secant from x = 1 to 2 is greater than slope of secant from 1 to 3 (d) $f'(1) > f'(4)$ because slope of tangent at x = 1 is greater than slope of tangent at x = 4 18) Done in class 20) (a) $m_{\text{sec}} = \frac{f(b) - f(a)}{b - a}$ (b) Slope of tangent at x = c appears to be about the same as slope of secant (c) See Solutions Manual 30) (a) They're the same (b) when setting up the difference quotient for $g'(x)$, the "+C" will cancel out
2.3	2) Done in class 24) Done in class 38) (a) t = 3; (b) t = 9; (c) t = 14; (d) You'd have a repeated feature like that found between t = 14 and t = 18 but with smaller amplitude. 40) (a) $x = x_3$; (b) $x = x_4$; (c) $x = x_5$; (d) $x = x_3$ (slope of tangent is most negative at $x = x_3$)
2.4	No evens assigned
1.2	16) (a) $[x_D, x_E], [x_H, x_I]$; (b) $[x_E, x_F], [x_A, x_B]$; (c) $[x_C, x_D], [x_G, x_H]$; (d) $[x_B, x_C], [x_F, x_G]$ 34) (a) g; (b) h; (c) f

2.5	4) (a) Graph is increasing and concave up (see #7); (b) Graph is increasing and concave up (see #11); (c) Graph is decreasing and concave up (see #10); (d) Graph is decreasing and concave down (see # 12). 6) See #11 (increasing and concave down) 24) Done in class
Review	18) (aa) C, D; (ab) B, C; (b) A,B and C, D