4.2 Day 3

p. 203: 11, 14, 36, 38, 40, 51-56

Wednesday, November 07, 2012
7:16 PM

11. Because the truckers' average speed was 79.5 mph, and by then MVT, the trucker must have been going that speed at least once during the trip.

14. The runner's average speed for the marathon was approx. 11.909 mph. Therefore, by the MVT, the runner must have been doing that speed at least once during the marathon. Since the initial speed and the final speed are both 0 mph and the runner's speed is continuous, by the IVT the runner is speed must have been 11 mph at least twice.

36. $f'(x) = \frac{1}{4x^{3/4}}$ $\quad P(1,-2)$

$f'(x) = \frac{1}{4}x^{-3/4}$

$f(x) = x^{1/4} + C$

$-2 = (1)^{1/4} + C$

$-3 + C$

$f(x) = x^{1/4} - 3$

38. $f'(x) = 2x + 1 - \cos x$ $\quad P(0,3)$

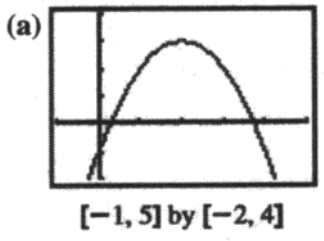
$f(x) = x^2 + x - \sin x + C$

$3 = 0^2 + 0 - \sin(0) + C$

$C = 3$

$f(x) = x^2 + x - \sin x + 3$

40. possible answers

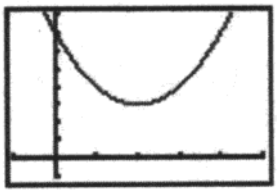


51. False. For example, the function x^3 is increasing on $(-1,1)$, but $f'(0) = 0$

52. True. In fact, f is increasing on $[a,b]$ since If $f' > 0$ at each pt. of (a,b), then f

[−1, 5] by [−2, 4]

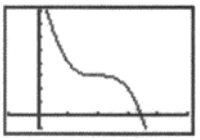
(b)



[−1, 5] by [−1, 8]

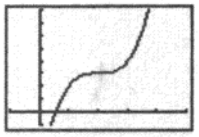
40. Continued

(c)



[−1, 5] by [−1, 8]

(d)



[−1, 5] by [−1, 8]

on $[a, b]$ since if $f' > 0$ at each pt. of (a, b), then f increases on $[a, b]$

53. A. $f'(x) = \dfrac{\frac{1}{2} - 1}{\frac{\pi}{3}} = -\dfrac{3}{2\pi}$.

54. B. $f'(x) = \dfrac{f(4) - f(0)}{4 - 0}$

$= \dfrac{3.78 - 2980.96}{4 - 0}$

$= -744.30$, negative slope.

55. E. $\dfrac{d}{dx}(2\sqrt{x} - 10)$

$= \dfrac{2}{2\sqrt{x}} = \dfrac{1}{\sqrt{x}}$.

56. D. $x^{3/5}$ is not differentiable at $x = 0$.