Lesson 6.4.3

6-150. See below:

a. $t = 6$ hours, at the end of the trip.

b. 21 mph

c. The areas are the same. Both equal 126.

d. $s(t) = -t^3 + 8.5t^2 + 6t$; $s(6) = 126$, $(126 - 0$ miles$) \div (6$ hrs$) = 21$ mph

e. $t = 1.093$ and $t = 4.573$ hours after he starts; Set answer to part (b) equal to $v(t)$.

6-151. See below:

a. 11.182 kilowatts; Find area under curve, then divide by 30 days.

b. During days 15, 17, and 19. Set answer to part (a) equal to $k(t)$.

6-152. The average rate of change of f in $[a, b]$ is zero, so there must be a point c where the instantaneous rate of change is zero.

6-153. $a = -1$ and $b = 1$. $f'(x) = 0$ for $x = -\frac{1}{2}$ and $x = 1$, but only $x = -\frac{1}{2}$ lies in the open interval (–1, 1). Therefore, $c = -\frac{1}{2}$.

6-154. This function is continuous, therefore the Mean Value Theorem applies.

6-155. See below:

a. Slope of tangents equal the average velocity.

b. ≈ 3.284 and 11.949 min

6-156. One possible counterexample: $y = \begin{cases} -1 & \text{for } x < 0 \\ 1 & \text{for } x \geq 0 \end{cases}$ over $[-1, 1]$

6-157. 0.464

6-158. See below:

a. $-6x\sin(3x^2)$

b. $-\cos(3x^2)+C$

c. $\frac{27x^8-5}{2\sqrt{3x^9-5x}}$

d. $2\sqrt{3x^9-5x}+C$

6-159. $y=1.5x^2+C$

6-160. See below:

a. $K(t)=8t-\sin t+\frac{0.01}{3}t^3+\frac{0.01}{2}t^2$; antiderivative or area function

b. $K(30)\approx 335.488$

c. Students sketch graph.

d. Average = 11.183; yes; slope of the line from (0, 0) to (30, 335.488)

6-161. See below:

a. $7\frac{2}{3}$

b. 5.541

6-162. $y=-x+1$

6-163. Min at $x=-3$, Max at $x=3$