Name:
Homework 6 solutions
Math 151, Applied Calculus, Spring 2018
Section 5.1 – 4,11,13,14,17,28

4 Lower estimate – 122 ft, Upper estimate – 298 ft.

11 The graph of velocity in this case is a line $f(t) = 5t$. The area under the graph is a triangle so distance travelled is $\frac{1}{2} \cdot 10 \cdot 50 = 250$ m.

13 You may ignore the estimate is the average of the upper and lower estimates 336 kg and 504 kg

14
- a Your graph should be a line starting at 50 ft/sec and decreasing at a constant rate to 0 in 5 sec.
- b Distance travelled is the triangular area under the graph 125 ft.
- c If the initial velocity is doubled to 100, it will take 10 sec for the car to come to rest. The new distance travelled is 500 ft.

17
- a Car A has the largest maximum velocity because the peak of car As velocity curve is higher than the peak of Bs.
- b Car A stops first because the curve representing its velocity hits zero (on the t-axis) first.
- c Car B travels farther because the area under car Bs velocity curve is the larger.

28
- a Left sum is 700.
- b Since the rate of emissions is increasing, this is a lower estimate.
- c Right sum with 3 intervals is $(21.9)(10) + (24.2)(10) + (34.7)(10) = 808$ billion tons.
- d The right sum givers an upper estimate of the emissions.

Section 5.2 – 7,8,9

7 $n = 4$ and Δx (size of interval) is 10. Take the average of the left and right hand sums so that $\int_0^{40} f(x)\,dx \approx 17,000$.

8 543.

9 16.1

Section 5.3 – 7,11,13,20

7 (a) Negative, (b) Positive, (c) Negative, (d) Positive

11 (a) -0.25, (b) 0, (c) 0.5

13 (a) 13, (b) 2, (c) 11, (d) 15

20 Compute the average of the lft and right hand sums, 337.5

Section 5.4 – 1,3,7,16

1 Change in position between $t = 1$ and $t = 3$.

3 Change in population between 2005 and 2011.

7 13.295 billion.

16 (a) The length growth rate is the derivative of the length function. A graph of the length function has an inflection point when its derivative has a maximum

(b) 50.2cm

Section 5.5 – 2,3,4,8

2 Cost of production in dollars of increasing production from 800 to 900.

3 Total cost = Fixed costs + Variable costs = $1,000,000 + 3,250,000 = 4,250,000$. Note that the variable costs are calculated as

$$\int_0^{500} C'(x)\,dx = 3,250,000$$

The Marginal cost function is a line so you can compute the area under the curve.

4 7.65 million people

8 (a) $\$18,650$ (b) \$28.