

Answers to Week 13

• **Section 4.3**

1. 2
2. $x = -2, 1$
3. $-\infty$

• **Section 4.4**

1. $4e^2$
2. $\frac{2 + \ln x}{2\sqrt{x}}$
3. $y' = y \left(\frac{12x^2}{x^3 + 1} + 2 \cot x - \frac{1}{3x} \right)$

• **Section 4.5**

1. $\frac{\ln 3}{20}$
2. $t = -\frac{1}{25} \ln \left(\frac{1}{10} \right) = \frac{\ln 10}{25}$ minutes

• **Section 4.6**

1. $-\frac{\pi}{6}$
2. $\frac{\pi}{6}$
3. $\frac{6}{x\sqrt{x^2 - 36}}$

• **Section 4.8**

1. $-\frac{1}{6}$
2. $\frac{4}{7}$
3. e^2

• **Section 5.1**

1.
 - (a) $(-\infty, -5) \cup (4, \infty)$
 - (b) $(0, \infty)$
2. See Example 3 in Section 5.1 of the *Stewart* text

• **Section 5.2**

1. $x = 1, x = \frac{3}{4}$
2. Abs max = $\sqrt{2}$, Abs min = -1

• **Section 5.3**

1. $x = -6$
2. f increasing $(-\infty, 0)$; decreasing $(0, \infty)$
 f conc up $(-\infty, -1) \cup (1, \infty)$; conc down $(-1, 1)$

• **Section 5.5**

1. $x = \frac{17}{5}$
2. maximum occurs when the entire wire is bent into a circle
3. $V = 6\pi\sqrt{12}$ cubic cm

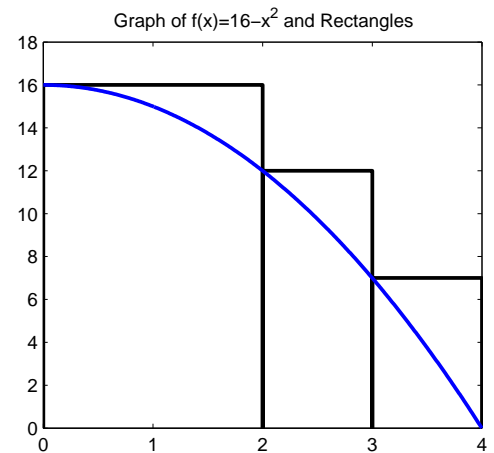
• **Section 5.7**

1. $F(x) = \frac{4}{3}x^{3/2} - \frac{1}{x} + C$
2. $f(x) = 2 \tan^{-1} x - \frac{\pi}{2}$
3. $\mathbf{r}(t) = \left(\frac{1}{2}t^2 + e^t - 1 \right) \mathbf{i} + (-\cos t + 2) \mathbf{j}$

• **Section 6.1**

1. 18
2. $\frac{20}{3}$

• **Section 6.2**



1. 51;
2. $2 \ln 2 + 2 \ln 4 + 2 \ln 6$
3. $\frac{20}{3}$