

Answers to Week 4

• Section 0.1

1. $\frac{x}{2x+1}, x \neq -\frac{1}{2}, -1$
2. $C(t) = \frac{800t}{2000+40t} = \frac{20t}{50+t}$
3. $S(x) = x^2 + \frac{800}{x}$

• Appendix D

1. $\frac{4\pi}{3}$, sine = $-\frac{\sqrt{3}}{2}$, cosine = $-\frac{1}{2}$, tangent = $\sqrt{3}$
cotangent = $\frac{1}{\sqrt{3}}$, secant = -2 , cosecant = $-\frac{2}{\sqrt{3}}$
2. $x = -\frac{\pi}{2} + 2\pi n, \frac{\pi}{6} + 2\pi n, \frac{5\pi}{6} + 2\pi n$
3. cosine = $\frac{\sqrt{7}}{4}$, tangent = $\frac{3}{\sqrt{7}}$, cotangent = $\frac{\sqrt{7}}{3}$,
secant = $\frac{4}{\sqrt{7}}$, cosecant = $\frac{4}{3}$

• Section 1.1

1. $\frac{3}{\sqrt{13}}\mathbf{i} - \frac{2}{\sqrt{13}}\mathbf{j}$
2. (approximate answers) speed = 17.4mph; $N35.6^\circ E$
3. $245\sqrt{3}$ Newtons

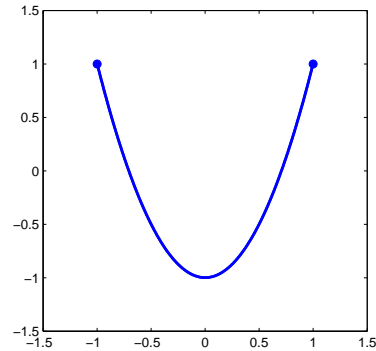
• Section 1.2

1. 5
2. $\text{comp}_{\mathbf{b}}\mathbf{a} = \frac{4}{\sqrt{5}}, \text{proj}_{\mathbf{b}}\mathbf{a} = \frac{4}{5}\mathbf{i} + \frac{8}{5}\mathbf{j}$.
3. 392 Joules

• Section 1.3

1. $x = -3 + 2t, y = -1 + 6t$ (other answers possible)

2. $y = 2x^2 - 1, -1 \leq x \leq 1$



• Section 2.2-2.3

1. .
 - (a) 1
 - (b) $-\frac{1}{9}\mathbf{i} + 3\mathbf{j}$
 - (c) 5
 - (d) $-\infty$

• Section 2.5

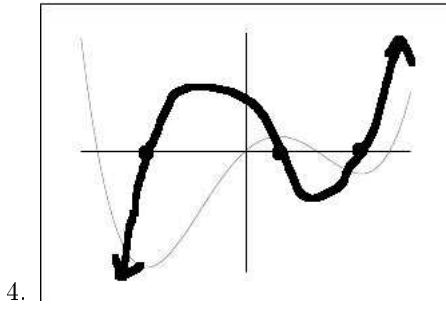
1. $x = -1$ Limit DNE
 $x = 1$ Limit $\neq f(1)$
2. $c = \frac{3}{2}$
3. Solution is between $x = 2$ and $x = 3$ by Intermediate Value Theorem

• Section 2.6

1. $\frac{4}{5}$
2. $\frac{3}{2}$
3. $-\frac{2}{5}$

• Section 2.7, 3.1

1. $3\mathbf{i} + 2\mathbf{j}$
2. $f'(x) = \frac{1}{\sqrt{2x-3}}$
3. 5



• **Section 3.2**

1. $f'(x) = 3 - x^{-1/2} - \frac{1}{2}x^{-3/2}$
2. 24
3. $y = \frac{3}{2}(x + 1)$
4. $(-2, 2), (6, 42)$