Section 2.2

4. (a) 3, (b) 1, (c) $\lim_{x\to 2} f(x)$ =d.n.e. as $\lim_{x\to 2^-} f(x) = 3 \neq \lim_{x\to 2^+} f(x) = 1$, (d) 3, (e) 4, (f) $f(4)$ is undefined. **32.** $-\infty$ **44a.** $x = 0$ and $x = \dfrac{3}{2}$.

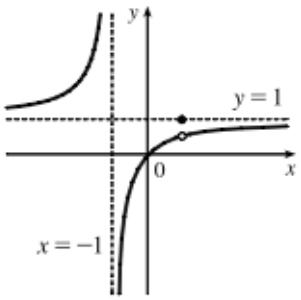
Section 2.3

2. (d) $\lim_{x\to 3} \dfrac{f(x)}{g(x)}$ =d.n.e. (Don't apply Limit laws here) as $\lim_{x\to 3^-} \dfrac{f(x)}{g(x)} = \infty \neq \lim_{x\to 3^+} \dfrac{f(x)}{g(x)} = -\infty$, (e) -4 Apply limit laws. **12.** $\dfrac{3}{7}$ **22.** $\dfrac{2}{3}$ **24.** $-\dfrac{1}{9}$

32. $-\dfrac{2}{x^3}$ **42.** $\lim_{x\to -6} f(x)$ =d.n.e. because $\lim_{x\to -6^-} f(x) = -2 \neq \lim_{x\to -6^+} f(x) = 2$

Section 2.5

20. f is discontinuous at 1 as $\lim_{x\to 1} f(x) = \dfrac{1}{2} \neq f(1) = 1$



46. **(modified)** $a = 4,\ b = -2$

Section 2.6

18. 2 **36.** 1 **40.** $-\dfrac{\pi}{2}$

Section 2.7

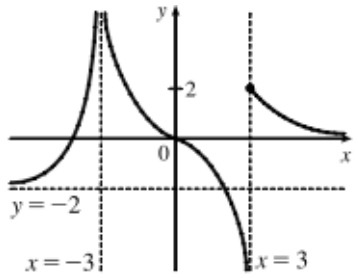
16b. $v(t) = t - 6$ and $v(8) = 2\,\text{ft/s}$ **31.** $f'(-4) = -28$ **33.** $f'(-4) = 5$

35. $f'(-4) = -\dfrac{1}{3}$, **42.** $f(\theta) = \sin\theta$ and $a = \dfrac{\pi}{6}$

Section 2.8

Q42. f is not differentiation;e at $x = -1$ due to discontinuity and at $x = 2$, it has a corner.

Chapter 2 Review:

Q2. 

10. -1 **18.** 0

Section 3.1

4. 0 (e^5 is constant) **18.** $y' = \frac{2}{3}x^{-2/3} + \frac{4}{3}x^{1/3}$ **22.** $y' = -\frac{3}{2}x^{-5/2} - x^{-2}$

50: (a) $v(t) = 4t^3 - 6t^2 + 2t - 1\ m/s, \quad a(t) = 12t^2 - 12t + 2\,m/s^2$ (b) $a(1) = 2\,m/s^2$

56: Horizontal tangent is at $x = \ln 2$

Section 3.2

14: $y' = \dfrac{2 - x}{2\sqrt{x}(2 + x)^2}$

Section 3.3

10. $\cos^2\theta - \sin^2\theta$

29. $H'(\pi/4) = \dfrac{\pi}{4\sqrt{2}} + \dfrac{1}{\sqrt{2}}, \ H''(\pi/4) = -\dfrac{\pi}{4\sqrt{2}} + \sqrt{2}, \quad H'(\pi/3) = \dfrac{\pi}{6} + \dfrac{\sqrt{3}}{2}, \quad H''(\pi/3) = -\dfrac{\pi\sqrt{3}}{6} + 1$

34. At $x = \dfrac{\pi}{4} + n\pi$ where n is an integer.