

1. a.  $-1$  b.  $4$  c.  $DNE$  d.  $3$  e.  $4$  f.  $2$  g.  $2$  h.  $\infty$  i.  $DNE$  j.  $-1$

2. a.  $-\frac{1}{2}$  b.  $-\frac{2}{343}$

3. a.  $\frac{7}{12}$  b.  $\sin^{-1}\left(-\frac{1}{2}\right) = -\frac{\pi}{6}$

4. a.  $y = -\frac{3}{2}, x = 2$  b.  $y = 5, y = -5, x = 5$

5.  $\mathbf{a} = \frac{7}{2}, \mathbf{b} = \frac{11}{2}$

6.  $f'(x) = \lim_{h \rightarrow 0} \frac{\frac{4(x+h)}{(x+h)+7} - \frac{4x}{x+7}}{h} = \dots = \frac{28}{(x+7)^2}$

7. a.  $35x^6 - 3e^x + \frac{5}{2}\sqrt{x^3} + \frac{24}{x^4}$

b.  $\left[\frac{1}{3}x^{-2/3} - 2x^{3/2}\right](e^x - 5x^2 + 8) + (x^{1/3} + 4x^{-1/2})[e^x - 10x]$

c.  $\frac{[\cos x](\cos x - 1) - \sin x[-\sin x]}{(\cos x - 1)^2} = \dots = \frac{1}{1 - \cos x}$