1. (a) $g'(x) = \dfrac{\sec^2(x)\cdot\left(1+x^4\right) - \tan(x)\cdot 4x^3}{\left(1+x^4\right)^2}$

   (b) $f'(t) = 2\sin\left(\cos\left(1+4^t\right)\right)\cdot\cos\left(\cos\left(1+4^t\right)\right)\cdot\left(-\sin\left(1+4^t\right)\right)\cdot 4^t\cdot\ln(4)$

   (c) (i) $y' = \left[3\ln\left(1+e^{2x}\right) + \dfrac{6xe^{2x}}{1+e^{2x}}\right]\cdot 5\left(1+e^{2x}\right)^{3x}$

2. (a) $-\dfrac{7}{4}$ (b) 1 (c) $\dfrac{5}{18}$

3. (a) $\lim\limits_{h\to 0}\dfrac{\sqrt{(2+h)^3+17}-5}{h}$ (b) 1.2

4. $\left(-\sqrt{3},\ 2\sqrt{3}\right)$

5. (a) -1 (b) DNE (c) $(-2,\ -1)$ (d) $(0,\ 1)$ (e) -1 is a local maximum (f) $f(-0.5)$

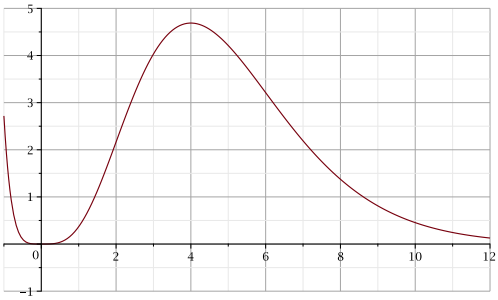
6. (a) $y = 0$ is a horizontal asympotote.

   (b) No vertical asymptotes.

   (c) Local max at $x = 4$, local min at $x = 0$.

   (d) Inflection points at $x = 2, 6$. Concave down on the interval $(2,\ 6)$.

   (e) Local (and global) minimum at $(0,0)$.
   Local maximum at about $(4, 4.7)$.
   Inflection points at about $(2, 2.2)$ and $(6, 3.2)$.



7. $r = 5$ and $h = 3$ feet

8. (a) $\dfrac{9}{14}$ rad/sec (b) -8.64 m/sec