1. (a) $f'(x) = \dfrac{-\frac{1}{\sqrt{1-x^2}} \cdot \sqrt{1+x^4} - \cos^{-1}(x) \cdot \frac{4x^3}{2\sqrt{1+x^4}}}{1+x^4}$

   (b) $g'(t) = \cos(2+\sin(2+\sin(2+t))) \cdot \cos(2+\sin(2+t)) \cdot \cos(2+t)$

   (c) $y' = (x^2+e^{-x})^{10x}\left(10\ln(x^2+e^{-x}) + 10x \cdot \dfrac{2x-e^{-x}}{x^2+e^{-x}}\right)$

2. (a) $-\dfrac{5}{24}$ (b) $-\infty$ (c) $\dfrac{4}{15}$

3. $\dfrac{dh}{dt} \approx -0.0998$ cm/sec

4. $h \approx 12.273$ cm and $r \approx 2.546$ cm

5. $y \approx -\dfrac{1}{30}$

6. (a) $x = -1, 1, 4, 7$ (b) $x = 1, 7$ (c) $(-3,-1)$, $(1,2)$, $(4,7)$, $(7,15)$

   (d) $(1,4)$, $(7,15)$ (e) $-\infty$ (f) $f''(2) < f'(2) < f'(13) < f(6)$ (g) 0

7. (a) π seconds (b) $B = 1$ (c) $A = 2$ (d) 4 m/sec

8. (a) There are no vertical asymptotes.
   The horizontal asymptotes are $y = 2$ and $y = -2$.

   (b) There are no local maxima and no local minima.

   (c) The function is concave up on $(-\infty, 0)$.
   $(0,0)$ is an inflection point.
   The function is concave down on $(0, \infty)$.