AP CALCULUS PROBLEM SET 2 ANSWER KEY

1. a) $x < -2$ or $x > 2$

   b) $x = -2,\ x = 2$

   c) $y = -1,\ y = 1$

   d) $f'(x) = \dfrac{-4}{(x^2-4)^{3/2}}$

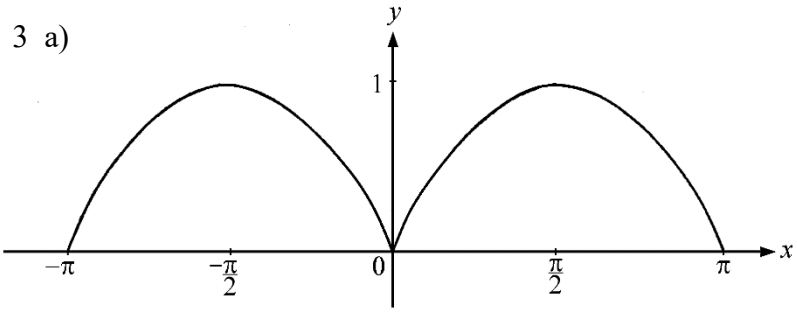
2 a) $x \in R$

   b) $f'(x) = \dfrac{-\cos x}{2\sqrt{1-\sin x}}$

   c) $x \in R,\ x \neq \dfrac{\pi}{2} + 2n\pi,\ n \in I$

   d) $y = -\dfrac{1}{2}x + 1$

3 a)



   b) $H(x) = g(f(x)) = |\sin x|^2 = \sin^2 x$

   c) $-\pi \le x \le \pi$

   $0 \le y \le 1$

   d) $y = x - \dfrac{\pi}{4} + \dfrac{1}{2}$ or $y = x - \dfrac{\pi - 2}{4}$

4. a) $y \le -4$ or $y \ge 4$

   b) $f(x) = f(-x)$, even symmetry

   c) $f'(x) = \dfrac{2x^3 - 16x}{\sqrt{x^4 - 16x^2}}$

   d) slope of the normal $= -\dfrac{3}{34}$

5. a) $y = \dfrac{3}{2}x - 1$

   b) $f(0.02) \approx 1.03$

   c) $f^{-1}(x) = \tan^{-1}(x^{\frac{2}{3}} - 1)$

6. a) $\left.\dfrac{d(f+g)}{dx}\right|_{x=2} = 13$

   b) $\left.\dfrac{d(fg)}{dx}\right|_{x=2} = 14 + 6\pi$

   c) $\left.\dfrac{d\left(\dfrac{f}{g}\right)}{dx}\right|_{x=2} = \dfrac{6\pi - 14}{\pi^2}$

   d) $h'(1) = 24$

   e) $\left.\dfrac{d\left(g^{-1}\right)}{dx}\right|_{x=2} = \dfrac{1}{4}$