Mathematics 1210 PRACTICE EXAM I Fall 2004
ANSWER KEY

1. (a) 6 (b) DNE; $\longrightarrow \pm\infty$ (c) DNE; $\longrightarrow \pm\infty$ (d) 0
   (e) 0 (f) 0 (g) DNE; LHL $\neq$ RHL (h) 0 (i) 2

2. (a) $f'(x) = \dfrac{1}{2\sqrt{x}}$, $g'(x) = \dfrac{-1}{x^2}$ (see pp. 108-109)

   (b) $y = \dfrac{1}{2}x + \dfrac{1}{2}$, $y = -x + 2$

3. See attached page.

   (a) all points except $x = 1$
   (b) all points except $x = -1, 1$
   (c) all points except $x = -1, 0, 1, 3$

4. See attached page.

5. (a) $f'(x) = 60x^4 + 20x^3 + 2x + 2$, $\displaystyle\int f(x)dx = 2x^6 + x^5 + \frac{1}{3}x^3 + x^2 + x + C$

   (b) $f'(x) = 3(x+1)^2$, $\displaystyle\int f(x)dx = \frac{1}{4}(x+1)^4 + C$

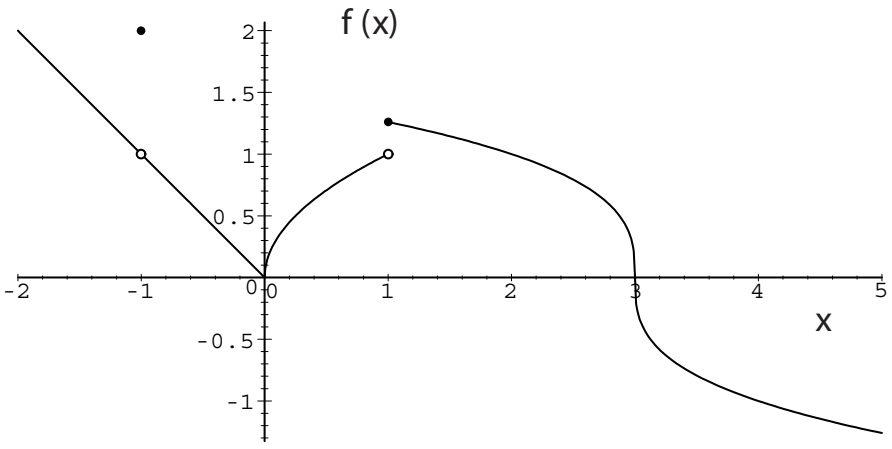
   (c) $f'(x) = 9x^2 - 10x + 3$, $\displaystyle\int f(x)dx = \frac{3}{4}x^4 - \frac{5}{3}x^3 + \frac{3}{2}x^2 - x + C$

6. $v(t) = 6t - 2$; $v = 0$ when $t = \dfrac{1}{3}$, $x = \dfrac{2}{3}$

7. $x(t) = -16t^2 + 22$. Setting $x(t^*) = 6$ yields $t^* = 1$ second; $v(t) = -32t$, so that $v(1) = -32$ feet/second

8. $x(t) = -\dfrac{t^3}{6} + v_0 t + x_0$; $x(t^*) = 0$ with $v_0 = 6$ and $x_0 = 0 \Longrightarrow t^* = 6$ seconds

3.



4.