

Sample Exam #1 Answers

Math 150–Hughes

1. a) -1

b) ∞

c) 9

d) $-\frac{2}{3}$

e) 1

2. a) 2

b) Discontinuities are at $x = 0$ and $x = 2$.

3. $y = -3x + 7$

4. $f(x) = \cos x$, $a = \pi$

5. a) $f'(x) = -4x^{-3} - 3x^{-2}$

b) $g'(x) = 3 \sec^2 3x - 6 \sec 3x \tan 3x$

c) $p'(x) = 3x^2 \cos x - x^3 \sin x$

d) $q'(x) = \frac{(6x + 1)(x + 4) - 1(3x^2 + x)}{(x + 4)^2} = \frac{3x^2 + 24x + 4}{(x + 4)^2}$

e) $h'(x) = \frac{1}{2}(4x^2 + 3x)^{-1/2}(8x + 3)$ or $\frac{8x + 3}{2\sqrt{4x^2 + 3x}}$

6. $\lim_{h \rightarrow 0} \frac{\sqrt{x+h} - \sqrt{x}}{h} = (\text{show steps}) = \lim_{h \rightarrow 0} \frac{1}{\sqrt{x+h} + \sqrt{x}} = \frac{1}{2\sqrt{x}}$

7. a) 48 ft/sec

b) 32 ft/sec