

Math 105  
Quiz 4 - Solutions

1.  $f(x) = 3x^4 + \sqrt{x} - \frac{6}{x^5} - \pi$

3pts

$$= 3x^4 + x^{1/2} - 6x^{-5} - \pi$$

$$f'(x) = 12x^3 + \frac{1}{2}x^{-1/2} + 30x^{-6} - 0$$

$$f'(x) = 12x^3 + \frac{1}{2\sqrt{x}} + \frac{30}{x^6}$$

2. (7p)

(2) a)

$$y = 2x^4 + 5x^3 - 3x^2 + 4x - 2$$

$$y' = 8x^3 + 15x^2 - 6x + 4$$

(5) b) Equa. of tan line  $x=1$

$$\begin{aligned} m = f'(1) &= 8(1)^3 + 15(1)^2 - 6(1) + 4 \\ &= 8 + 15 - 6 + 4 \\ &= 23 - 2 \end{aligned}$$

$$m = 21$$

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$$(1, f(1))$$

$$(1, 6)$$

$$y - y_1 = m(x - x_1)$$

$$y - 6 = 21(x - 1)$$

$$y = 21x - 21 + 6$$

$$y = 21x - 15$$

$$\begin{aligned} f(1) &= 2(1) + 5(1) - 3(1) + 4(1) - 2 \\ &= 7 - 3 + 4 - 2 \end{aligned}$$

$$= 11 - 5$$

$$= 6$$