

Math 119 HW #5

Section 4.3 #10, 22, 30, 35, 62

4.3 #10 $f(x) = \frac{2}{x^4}$ $g(x) = 2 - x$

$$f(g(x)) = f(2-x) = \frac{2}{(2-x)^4}$$

$$g(f(x)) = g\left(\frac{2}{x^4}\right) = 2 - \frac{2}{x^4}$$

4.3 #22 $y = (2x^3 + 9x)^5$

$$\frac{dy}{dx} = 5(2x^3 + 9x)^4 \cdot (6x + 9)$$

4.3 #30 $r(t) = 4t(2t^5 + 3)^4$

$$r'(t) = 4t \cdot 4(2t^5 + 3)^3 \cdot 10t^4 + (2t^5 + 3)^4 \cdot 4$$

4.3 #35 $y = \frac{-5}{(2x^3 + 1)^2} = -5(2x^3 + 1)^{-2}$

$$\frac{dy}{dx} = 10(2x^3 + 1)^{-3} \cdot 6x^2$$

4.3 #62a $N(t) = 2t(5t+9)^{1/2} + 12$

$$N'(t) = 2t \cdot \frac{1}{2}(5t+9)^{-1/2} \cdot 5 + (5t+9)^{1/2} \cdot 2$$

$$N'(0) = 2 \cdot 0 \cdot \frac{1}{2}(5 \cdot 0 + 9)^{-1/2} \cdot 5 + (5 \cdot 0 + 9)^{1/2} \cdot 2$$

$$= 0 + 9^{1/2} \cdot 2 = 3 \cdot 2 = \underline{6}$$