

# CALCULUS WARM UP

DAY AFTER SECTION 3.3

Find  $\frac{dy}{dx}$

1)  $y = \frac{2}{5}x^5 - \frac{x^4}{7} + \frac{6}{x^2} - \pi^4$

Hint: rewrite first

2)  $y = x^\pi$

3)  $y = (2x^3 + 1)(x + 5)$

4)  $y = \frac{x^3}{x^2 + 1}$

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#23, #24 c)  $\frac{d}{dx} \left( \frac{v}{u} \right)$

Find  $\frac{dy}{dx}$

1)  $y = \frac{2}{5}x^5 - \frac{x^4}{7} + \frac{6}{x^2} - \pi^4$

Hint: rewrite first

$$y = \frac{2}{5}x^5 - \frac{1}{7}x^4 + 6x^{-2} - \pi^4$$

$$y' = 2x^4 - \frac{4}{7}x^3 - 12x^{-3}$$

2)  $y = x^\pi$   
 $y' = \pi x^{\pi-1}$

3)  $y = (2x^3 + 1)(x + 5)$

$$y' = (2x^3 + 1)(1) + (x + 5)(6x^2)$$

$$y' = 2x^3 + 1 + 6x^3 + 30x^2$$

$$y' = 8x^3 + 30x^2 + 1$$

4)  $y = \frac{x^3}{x^2 + 1}$   
 $y' = \frac{(x^2 + 1)(3x^2) - (x^3)(2x)}{(x^2 + 1)^2}$

$$y' = \frac{3x^4 + 3x^2 - 2x^4}{(x^2 + 1)^2}$$

$$y' = \frac{x^4 + 3x^2}{(x^2 + 1)^2}$$