

Calculus Warm-Up Day after 4.1

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. $y = (2x+5)\sin x$

4. $y = 7(x^2 + 3x)^5$

5. $y = \sqrt[4]{2-x}$
(Hint: Rewrite first)

6. $y = \csc 2x - 5x^3 \cdot \sin x$

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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. $y = (2x+5)\sin x$
 $y' = (2x+5)\cos x + \sin x(2)$

4. $y = 7(x^2 + 3x)^5$
 $y' = 7 \cdot 5(x^2 + 3x)^4(2x+3)$
 $y' = 35(x^2 + 3x)^4(2x+3)$

5. $y = \sqrt[4]{2-x}$
(Hint: Rewrite first)
 $y = (2-x)^{1/4}$
 $y' = \frac{1}{4}(2-x)^{-3/4}(-1)$
 $y' = \frac{-1}{4\sqrt[4]{(2-x)^3}}$

6. $y = \csc(2x) - 5x^3 \cdot \sin x$
 $y' = -\csc(2x)\cot(2x) \cdot 2 - (5x^3 \cos x + \sin x \cdot 15x^2)$
 $y' = -2\csc(2x)\cot(2x) - 5x^3 \cos x - 15x^2 \sin x$