

PRACTICE QUIZ 15 SOLUTIONS

ADRIAN PĂCURAR

Time: 10 min

Time to beat: ? min

Problem 1. Differentiate $s(t) = (t^2 - 3)^4$.

By the Chain Rule, this is

$$s'(t) = 4(t^2 - 3)^3(2t) = 8t(t^2 - 3)^3$$

Problem 2. Find dz/dy for $z(y) = \frac{3}{(a^2 - y^2)^2}$.

Treating a as a constant, we have

$$\frac{d}{dy} 3(a^2 - y^2)^{-2} = -6(a^2 - y^2)^{-3}(-2y) = \frac{12y}{(a^2 - y^2)^3}$$

Problem 3. Differentiate $f(x) = \sqrt{x^2 + 6x + 3}$.

Since the derivative of \sqrt{x} is $\frac{1}{2\sqrt{x}}$, we apply the chain rule and get

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

Problem 4. Differentiate $y = \frac{3-2x}{3+2x}$.

By the Quotient Rule, we have

$$y' = \frac{(3 - 2x)'(3 + 2x) - (3 - 2x)(3 + 2x)'}{(3 + 2x)^2} = \frac{(-2)(3 + 2x) - (3 - 2x)(2)}{(3 + 2x)^2} = \frac{-12}{(3 + 2x)^2}$$