

Calculus I

Section 3.3 – Techniques of Differentiation

Find $\frac{dy}{dx}$ for each of the following.

1. $f(x) = x^3 - 3x - \frac{2}{x^4}$

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

3. $y = \sqrt[3]{x} + \sqrt[5]{x}$

4. $f(x) = \frac{\pi}{(3x)^2}$

5. $y = \frac{x+1}{x^2+2x+2}$

6. $f(x) = (3x - 2x^2)(5 + 4x)$

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$$7. y = \left(\frac{x+1}{x+2} \right) (2x-5)$$

$$8. f(x) = \frac{3 - \frac{1}{x}}{x+5}$$

Find $\frac{d^2y}{dx^2}$.

$$9. y = 7x^4 - 3x^5 + 2x$$

$$10. y = (x^3 + 5)(2 - 3x)$$