

Derivatives

Advanced

Higher Order

1. $\frac{d^3}{dx^3}(\ln(x))$

2. $\frac{d^3}{dx^3}(6x^3 - 4x^4)$

3. $\frac{d^3}{dx^3}(x^n)$

4. $\frac{d^3}{dx^3}e^{x^2}$

5. $\frac{d^4}{dy^4}(a^y)$

6. $\frac{d^4}{dx^4}\left(\frac{x-2}{x-3}\right)$

7. $\frac{d^4}{dx^4}\ln(x^2 + 1)$

8. $\frac{d^4}{dx^4}(e^{-x^2})$

9. $\frac{d^5}{dx^5}\left(\frac{1}{e^{2x} - 1}\right)$

10. $\frac{d^5}{dx^5}(\sin^{-1}x)$

Answers

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$$1. \frac{2}{x^3}$$

$$2. 36 - 96x$$

$$3. nx^{n-3}(n-1)(n-2)$$

$$4. 2\left(4e^{x^2}x^3 + 6e^{x^2}x\right)$$

$$5. a^y \ln^4(a)$$

$$6. \frac{24}{(x-3)^5}$$

$$7. -\frac{12(x^4 - 6x^2 + 1)}{(x^2 + 1)^4}$$

$$8. -2\left(-8e^{-x^2}x^4 + 24e^{-x^2}x^2 - 6e^{-x^2}\right)$$

$$9. \frac{32e^{2x}\left(-26e^{2x} - 66e^{4x} - 26e^{6x} - e^{8x} - 1\right)}{\left(e^{2x} - 1\right)^6}$$

$$10. \frac{3\left(8x^4 + 24x^2 + 3\right)}{\left(1 - x^2\right)^{\frac{9}{2}}}$$