Calculus 1
Day Gateway Practice

October 2, 2017

Table of contents

Chain Rule, Power Rule

Find the derivative of

$$\left(v^2 e^{-6v} + 3e^{2v}\right)^4$$

Chain Rule, Power Rule

Find the derivative of

$$\left(v^2 e^{-6v} + 3e^{2v}\right)^4$$

Answer:

$$4\left(v^2 e^{-6v} + 3e^{2v}\right)^3\left(2ve^{-6v} - 6v^2 e^{-6v} + 6e^{2v}\right)$$

Clicker

Find the derivative of

$$\frac{2z^4 - 4z}{2z^5 - 1}$$

a) $\dfrac{(2z^4-4z)\cdot 10z^4 - (8z^3-4)(2z^5-1)}{(2z^5-1)^2}$

b) $\dfrac{(8z^3-4)(2z^5-1) - (2z^4-4z)\cdot 10z^4}{(2z^5-1)^2}$

c) $\dfrac{(2z^4-4z)\cdot 10z^4 - (8z^3-4)(2z^5-1)}{(2z^4-4z)^2}$

d) $\dfrac{(8z^3-4)(2z^5-1) - (2z^4-4z)\cdot 10z^4}{(2z^4-4z)^2}$

Chain Rule, Power Rule, Trig

Find the derivative of

$$\left(\cos\left(w^4 + 3w\right)\right)^2$$

Chain Rule, Power Rule, Trig

Find the derivative of

$$\left(\cos\left(w^4 + 3w\right)\right)^2$$

Answer:

$$-2\cos\left(w^4 + 3w\right)\left(4w^3 + 3\right)\sin\left(w^4 + 3w\right)$$

Clicker

Find the derivative of

$$2\pi + 2\ln(5x) + 4x^{0.75} + 4\arctan(x)$$

a) $\frac{5}{x} + 3x^{-0.25} + \frac{4}{1-x^2}$

b) $\frac{2}{x} + 3x^{-0.25} + \frac{4}{1-x^2}$

c) $\frac{2}{x} + 3x^{-0.25} + \frac{4}{\sqrt{1+x^2}}$

d) $\frac{2}{x} + 3x^{-0.25} + \frac{4}{1+x^2}$

Quotient Rule, Chain Rule, Trig

Find the derivative of

$$\frac{\sin^4(y)}{2y^5 - 5y}$$

Quotient Rule, Chain Rule, Trig

Find the derivative of

$$\frac{\sin^4(y)}{2y^5 - 5y}$$

Answer:

$$\frac{4\sin^3(y)\cos(y)\left(2y^5 - 5y\right) - \sin^4(y)\left(10y^4 - 5\right)}{\left(2y^5 - 5y\right)^2}$$

Chain Rule, Trig, Exponential

Find the derivative of

$$e^{2v^2 + \cos(5v)}$$

Chain Rule, Trig, Exponential

Find the derivative of

$$e^{2v^2 + \cos(5v)}$$

Answer:

$$(4v - 5\sin(5v))\, e^{2v^2 + \cos(5v)}$$

Product Rule, Trig, Exponential

Find the derivative of

$$\left(e^{-5v} + v\right)(2 + \cos(6v))$$

Product Rule, Trig, Exponential

Find the derivative of

$$\left(e^{-5v} + v\right)(2 + \cos(6v))$$

Answer:
$$\left(1 - 5e^{-5v}\right)(2 + \cos(6v)) - \left(e^{-5v} + v\right) \cdot 6\sin(6v)$$

Clicker

Find the derivative of

$$u^4 \sin\left(e^{3u}\right)$$

a) $4u^3 \sin\left(e^{3u}\right) + u^4 \cdot 3 \sin\left(e^{3u}\right) e^{3u}$

b) $4u^3 \sin\left(e^{3u}\right) + u^4 \cdot 3 \sin\left(e^{3u}\right) e^{3u} * u$

c) $4u^3 \sin\left(e^{3u}\right) + u^4 \cdot 3 \cos\left(e^{3u}\right) e^{3u} * u$

d) $4u^3 \sin\left(e^{3u}\right) + u^4 \cdot 3 \cos\left(e^{3u}\right) e^{3u}$

Product Rule, Power, Exponential

Find the derivative of

$$x^5 \left(e^{-3x} - 1 \right)^3$$

Product Rule, Power, Exponential

Find the derivative of

$$x^5 \left(e^{-3x} - 1\right)^3$$

Answer:

$$5x^4 \left(e^{-3x} - 1\right)^3 - x^5 \cdot 3\left(e^{-3x} - 1\right)^2 \cdot 3e^{-3x}$$

More Practice

Find the derivative of

$$\left(\cos\left(u^4 + 6u\right)\right)^6$$

More Practice

Find the derivative of

$$\left(\cos\left(u^4 + 6u\right)\right)^6$$

Answer:
$-6\cos^5\left(u^4 + 6u\right)\sin\left(u^4 + 6u\right)\left(4u^3 + 6\right)$

More Practice

Find the derivative of

$$\ln\left(e^u \sin(u) + 2\pi^6\right)$$

More Practice

Find the derivative of

$$\ln\bigl(e^u \sin(u) + 2\pi^6\bigr)$$

Answer:

$$\frac{e^u \sin(u) + e^u \cos(u)}{e^u \sin(u) + 2\pi^6}$$

More Practice

Find the derivative of

$$\left(5u^4 + 1\right)\left(e^{4u} + 5u\right)$$

More Practice

Find the derivative of

$$(5u^4 + 1)(e^{4u} + 5u)$$

Answer:
$20u^3(e^{4u} + 5u) + (5u^4 + 1)(4e^{4u} + 5)$