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Practice Problems

Name:_____

Period: _____ Date: _____

Form #91529164728

Step-By-Step

Answers

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Solve:

1) Given $p(x) = \sin^3(4x^2 + 4x + 2)$. What is $p'(x)$?

$p(x) = u^3$ $\quad u = \sin(4x^2+4x+2)$

$p'(x) = 3u^2 \cdot u'$ $\quad u' = (8x+4)(\cos(4x^2+4x+2))$

$= 3\sin^2(4x^2+4x+2)(8x+4)\cos(4x^2+4x+2)$

$= \boxed{3(8x+4)\cos(4x^2+4x+2)\sin^2(4x^2+4x+2)}$

2) Given $v(x) = \sqrt{e^{2x^2-2x}}$. What is $\frac{dv}{dx}$?

$u = e^{2x^2-2x}$

$u' = (4x-2)e^{2x^2-2x}$

$v(x) = u^{1/2}$

$v'(x) = \frac{1}{2}u^{-1/2} \cdot u'$

$= \boxed{\frac{(2x-1)e^{2x^2-2x}}{\sqrt{e^{2x^2-2x}}}}$

3) Given $k(x) = \cot(e^{-5x^2-x+4})$. What is $k'(x)$?

$k(x) = \cot u$ $\quad u = e^{-5x^2-x+4}$

$k'(x) = -\csc^2 u \cdot u'$ $\quad u' = (-10x-1)e^{-5x^2-x+4}$

$= \boxed{(10x+1)(e^{-5x^2-x+4})\csc^2(e^{-5x^2-x+4})}$

4) What is the derivative of: $n(x) = \cos(e^{3x+4})$?

$n(x) = \cos u$ $\quad u = e^{3x+4}$

$n'(x) = -\sin u \cdot u'$ $\quad u' = 3e^{3x+4}$

$= \boxed{-3e^{3x+4}\sin(e^{3x+4})}$

5) Given $w(x) = \cos^3(-3x)$. What is $w'(x)$?

$w(x) = u^3$ $\quad u = \cos(-3x)$

$w'(x) = 3u^2 \cdot u'$ $\quad u' = 3\sin(-3x)$

$= \boxed{9\sin(-3x)\cos^2(-3x)}$

6) Given $q(x) = \sqrt{e^{3x+5}}$. What is $q'(x)$?

$u = e^{3x+5}$

$u' = 3e^{3x+5}$

$q(x) = u^{1/2}$

$q'(x) = \frac{1}{2}u^{-1/2} \cdot u'$

$= \boxed{\frac{3e^{3x+5}}{2\sqrt{e^{3x+5}}}}$