

Product rule quiz answers

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12:54 PM

Differentiate the following

① $y = (x+1)(x-2)$

if $y = u \cdot v$ where $u = x+1$ and $v = x-2$
 $u' = 1$ $v' = 1$

$$y' = u \cdot v' + v \cdot u' = (x+1) \times 1 + (x-2) \times 1 = x+1 + x-2 = 2x-1$$

② $y = (2x+1)(4x-3)$

$u = 2x+1$ $v = 4x-3$

$u' = 2$ $v' = 4$

$$y' = u \cdot v' + v \cdot u'$$

$$= (2x+1) \times 4 + (4x-3) \times 2$$

$$= 8x+4 + 8x-6 = 16x-2$$

③ $y = (2x-3)^2 (4x^2+1)^3$

$u = (2x-3)^2$

$u' = 2(2x-3) \times 2$

$= 4(2x-3)$

$v = (4x^2+1)^3$

$v' = 3(4x^2+1)^2 \times 8x$

$= 24x(4x^2+1)^2$

$$y' = u \times v' + v \times u'$$

$$= (2x-3)^2 \times 24x(4x^2+1)^2 + (4x^2+1)^3 \times 4(2x-3)$$

$$= 24x(2x-3)^2(4x^2+1)^2 + 4(4x^2+1)^3(2x-3)$$