

(2,3) slope at x=2 (2,1) slope at x=2

U) Suppose u and v are differentiable functions at x = 2 and

$u(2) = 3$ $u'(2) = 3$ $v(2) = 1$ $v'(2) = 2$

i) Find $\frac{d}{dx}(uv)$ at x=2

$$\frac{d}{dx}(u \cdot v) = u(2) \cdot v'(2) + v(2) \cdot u'(2) = 3 \cdot 2 + 1 \cdot 3 = 9$$

ii) Find $\frac{d}{dx}\left(\frac{u}{v}\right)$

$$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v(2) \cdot u'(2) - u(2) \cdot v'(2)}{[v(2)]^2} = \frac{1(3) - 3(2)}{1^2}$$

iii) Find $\frac{d}{dx}(3u - 2v + 2uv)$

$$\frac{d}{dx}(3u - 2v + 2uv) = 3u'(2) - 2v'(2) + 2[uv' + vu'] = 3(3) - 2(2) + 2[9] = 21$$

V) Find the derivative of y = x with respect to x

W) Find the derivative of y = x with respect to t

X) Find the derivative of y = x with respect to P

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