

Suppose u and v are differentiable functions of x . Use the given values of the functions and their derivatives to find the value of the indicated derivative.

10) $u(2) = 10, u'(2) = 2, v(2) = -3, v'(2) = -5.$

$$\frac{d}{dx} \left(\frac{v}{u} \right) \text{ at } x=2$$

Handwritten notes: An arrow points from the fraction to the word "no" below it. Another arrow points from the fraction to the word "hi" above it.

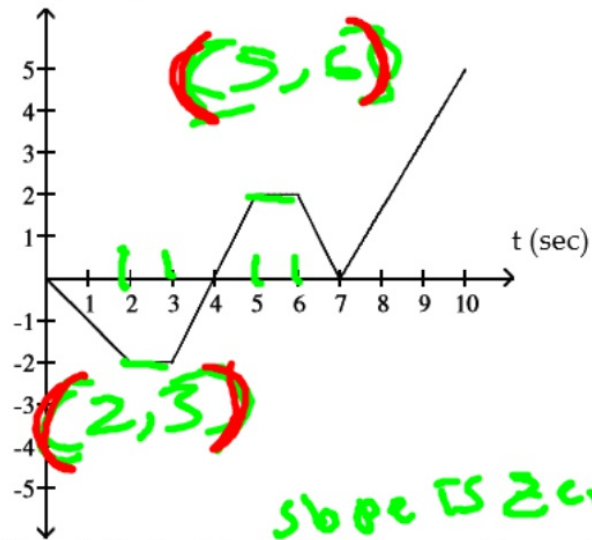
$$\frac{uv' - vu'}{u^2} = \frac{(10)(-5) - (-3)(2)}{10^2}$$

$$= \frac{-50 + 6}{100} = \frac{-44}{100} = -\frac{11}{25}$$

The figure shows the velocity v of a body moving along a coordinate line as a function of time t . Use the figure to answer the question.

11) v (ft/sec)

11) _____



acceleration \Rightarrow
"change" of velocity
slope

When is the body's acceleration equal to zero?

Solve the problem.

12) At time t , the position of a body moving along the s -axis is $s = t^3 - 15t^2 + 72t$ m. Find the body's acceleration each time the velocity is zero. 12) _____

acceleration \Rightarrow
"change" of velocity
slope

position

$$s = t^3 - 15t^2 + 72t$$

velocity

$$s' = v = 3t^2 - 30t + 72 = 0$$

acceleration

$$s'' = v' = 6t - 30$$

$$\frac{3t^2 - 30t + 72}{3} = 0$$

$$t^2 - 10t + 24 = 0$$

$$(t - 6)(t - 4) = 0$$

$$t = 6$$

$$t = 4$$

$$6(6) - 30 = 6$$
$$6(4) - 30 = -6$$