

Review this line, what should go there Key

AP Physics C: Ch.0 Calculus Review

Define the following terms

- 1) Average Rate of Change: $\frac{f(b)-f(a)}{b-a}$
- 2) Derivative: a formula to calculate the slope at any point
- 3) Integral: a formula to calculate the area over a given interval

Answer the following questions

- 4) If a function is $f(x) = 5x^2 - 7x + 3$, what would be an equation that could tell me the slope anywhere I wanted? $f'(x) = 10x - 7$

- 5) If a function is $f(x) = -\sin(x)$,

a. Find $\frac{dy}{dx}$? $f'(x) = -\cos(x)$

- b. What would be the slope of the line at $x = \frac{\pi}{6}$? Put the answer in exact form.

$$f'(\frac{\pi}{6}) = -\frac{\sqrt{3}}{2}$$

- c. What would be the slope of the line at $x = \frac{\pi}{6}$? Put the answer in decimal form.

$$f'(\frac{\pi}{6}) = -0.866$$

- d. What would be the integral for the interval $[0, \frac{\pi}{6}]$?

$$\int_0^{\pi/6} f(x) dx = -0.134$$

- 6) Function $g(t) = \sqrt[5]{(3t-5)^2}$

a. What is the derivative of this function? (write answer in radical form) $g'(t) = \frac{6}{5\sqrt[5]{(3t-5)^3}}$

- b. What is the instantaneous rate of change of $g(t)$ at $t=2$?

$$g'(2) = 4/5$$

- c. Find $g'(0)$?

$$g'(0) = -0.456$$

- d. Explain what $g'(0)$ calculated.

the slope of $g(t)$ at $t=0$.

- e. Calculate the t -value when $g(t)$ has a slope of 2.

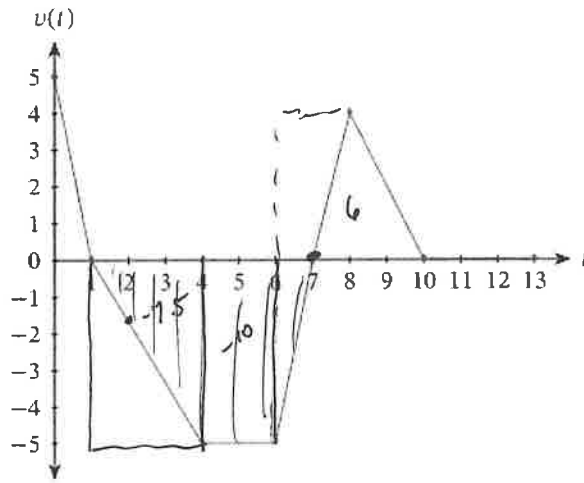
$$t = 1.809$$

f. Calculate $\int_0^4 g(t) dt = 0.274$

- g. Explain what $\int_0^4 g(t) dt$ calculated.

the area of $g(t)$ from $t=0$ to $t=4$

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7) Answer the following questions with the graph above for the function $v(t)$.

a. Calculate the derivative of the graph at $x=2$? $\boxed{-\frac{5}{3}}$

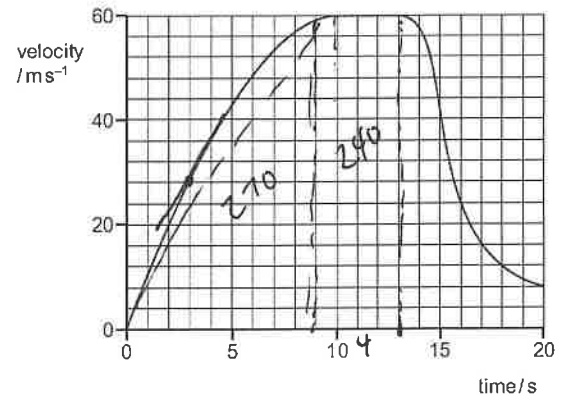
b. Calculate $v'(7)$? $\boxed{4}$

c. Calculate the area of the graph from $[1,7]$? $-\frac{3(5)}{2} + 2(-5) + \frac{(1)(-5)}{2} = -7.5 - 10 - 2.5 = \boxed{-20}$

d. $\int_0^{10} v(t) dt = \boxed{-11.5}$

8) On the above graph I was able to tell you to calculate the exact derivative at a point or integral for an interval.

a. Why can I not ask you to calculate the exact integral or derivative on the graph to the right?
because the lines are curved



b. Which estimate below is the closest to the integral of the graph to the right for the interval $[0,13]$.

A. 380

B. 570

C. 780

D. 1200

c. Which estimate is the closest to the derivative of the the point at $t=3$?

A. 0

B. 2

c. 5

d. -2

e. -3