5-3 Change

Tuesday, February 8, 2022   1:52 PM

Natural log?

ln = "logarithm natural"
= $\log_e$ *$e \approx 2.7$*

HW14: Problem 3

Use natural logs to solve the following:

a) $e^x = 10$ $\log_e(e^x) = x = \log_e(10)$

x= $x = \ln(10)$

b) $e^{2x} = e^8$ $\ln(e^{2x}) = \ln(e^8)$

x= $2x = 8$

c) $3^x = 7$ $\log_3(3^x) = x = \log_3(7) = \dfrac{\ln(7)}{\ln(3)}$

x= $x = \dfrac{\ln(7)}{\ln(3)}$

d) $5 \times 2^x = 3^x$ $\ln(5 \cdot 2^x) = \ln(3^x)$

x= $x = \dfrac{-\ln(5)}{\ln(2) - \ln(3)}$

$\ln(5) + x \cdot \ln(2) = x \cdot \ln(3)$

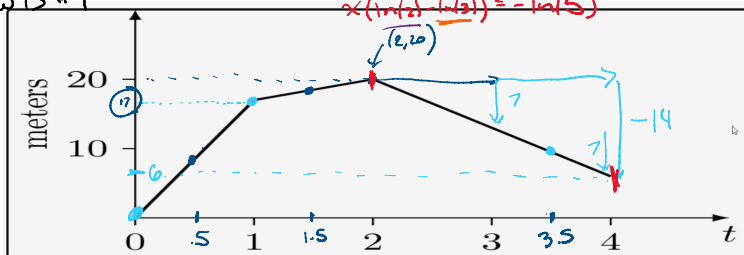$x \cdot \ln(2) - x \cdot \ln(3) = -\ln(5)$

$x(\ln(2) - \ln(3)) = -\ln(5)$

e^x has e^x as its rate of growth

c) $3^x = 7$

$\ln(3^x) = \ln(7)$

$x \cdot \ln(3) = \ln(7)$

HW 13 #9

(2,20)

17

-6

-14

7

7

| meters | 20 | 10 |
| 0 | .5 | 1 | 1.5 | 2 | 3 | 3.5 | 4 | t |

What was the speed of the object at the following times.

(a) At $t = 0.5$, the speed was $\dfrac{8}{.5}$ m/s

(b) At $t = 1.5$, the speed was   3 or 4   m/s
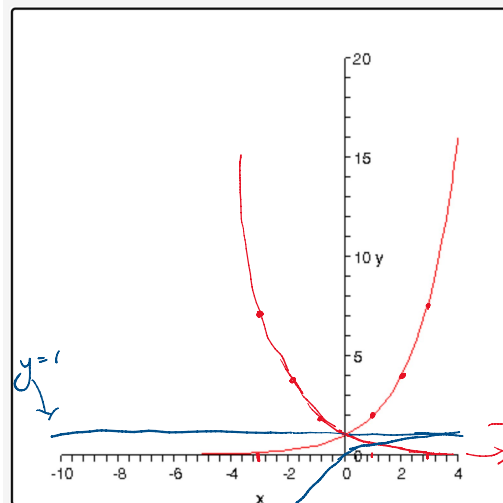
(c) At $t = 3.5$, the speed was   -7   m/s

(d) What is the significance of the fact that the graph slopes downwards between $t = 2$ and $t = 4$? [Hint: speed=distance gone divided by time taken] (You don't have to answer this here)

HW14: Problem 1

Here is the graph $y = 2^x$

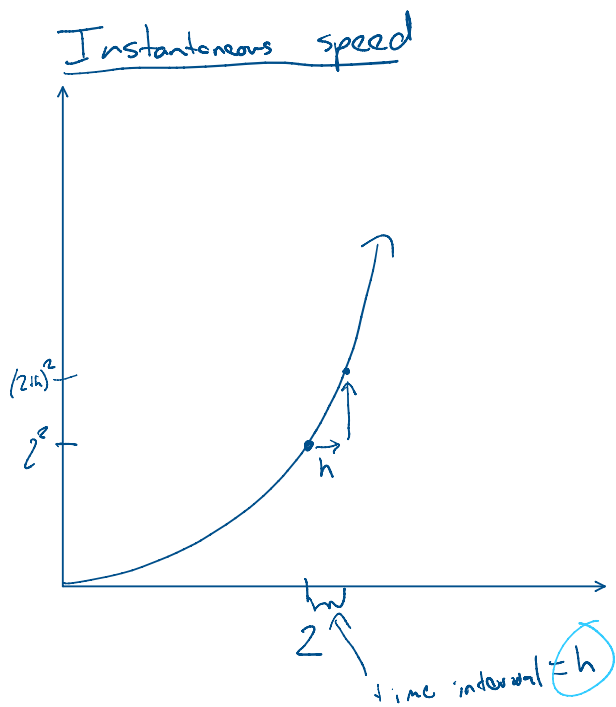|	
20	
15	
10 y	
5	
-10 -8 -6 -4 -2 0 2 4	

$y = 1$

these should be close to 1

On your paper, sketch the graph of $y = 1 - 2^{-x}$ [HINT: first sketch 2^{-x}]

Which of these best matches your graph?

Instantaneous speed

$y = x^2$

Instantaneous speed

$y = x^2$

Final height − initial height

$= y_2 - y_1$

$= (2+h)^2 - 2^2 = \cancel{4} + 4h + h^2 - \cancel{4}$

$= \boxed{4h + h^2}$:)

$h=1: 5$ average speed $= 5$

$h=.1: .4 + .01 = .41$ $\dfrac{.41}{.1} = 4.1$

$h=.01: .04 + .0001 = .0401$ average speed $= \dfrac{.0401}{.01} = 4.01$

2 time interval $= h$

Average speed $= \dfrac{rise}{run} = \dfrac{4h + h^2}{h} = \dfrac{\cancel{h}(4+h)}{\cancel{h}} = 4 + h$

error