Homework Journal

4.9 #4 initial height 4 increases exponentially, doubling each day

a. $f(x) = 4(2)^t$ ← days since planted
(4 = initial, $(2)^t$ = exponential growth)

For me, I was thinking about the function that has to do with % but this question has nothing to do with %. So I have to forget about that equation for this problem.

b. Mood How many days would the beanstalk reach the moon? (moon: 238,900 miles from earth, & 5,280 feet in 1 mile)

1 mile = 5,280

238,900 miles = 238,900 × 5280

238,900 miles = 1,261,392,000 feet

$4(2)^t$ → function

$4(2)^t = 1,261,392,000$

$2^t = 315,348,000$

$t = \log_2(315348000)$

$t = 28.23236954$

c. Sun How many days would the beanstalk reach the sun? (sun: 92,960,000 miles from earth, & 5,280 feet in 1 mile)

1 mile = 5,280

92,960,000 = 92,960,000 × 5,280

92,960,000 = 490,828,800,000

$4(2)^t$ → function

$4(2)^t = 490,828,800,000$

$2^t = 122,707,200,000$

$t = \log_2(122,707,200,000)$

$t = 36.83642894$

I chose this problem because I want to be able to look back and see how I solved a problem like this one. This problem focused on using the equation we created to find the answers x years.

Homework Journal

4.9 #9 Alan's body = 13.8% per hour

a. 82 mg of caffeine How long will it take for Alan's body to metabolize half of the 82 mg of caffeine?

1 hour = 13.8%

100 - 13.8 = 86.2%

half of 82

$$\frac{\log(\frac{1}{2})}{\log(0.862)} = 4.66765$$

b. 226mg How long will it take, for half of 226 mg of energy drink to be metabolized.

1 hour = 13.8%

100 - 13.8 = 86.2

$$\frac{\log(\frac{1}{2})}{\log(0.862)} = 4.66765$$

c. C mg of caffeine half?

1 hour = C mg

100 - 13.8 = 86.2%

$$\frac{\log(\frac{1}{2})}{\log(0.862)} = 4.66765$$

I chose this problem because I wanted something to look back at. This question shows how we use log in order to find our answer.

Homework Journal

becomes my base → becomes my equal

$\#^{\#} = \#$ → becomes what is inside the parenthesis

4.8 #2

a. $7^x = 84$

$x = \log_7(84)$

b. $6^x = \frac{1}{1296}$

$x = \log_6\left(\frac{1}{1296}\right)$

c. $5^x = -86$

$x = DNE$

I always struggle with the basics of log which is why I chose this problem. I just want something to look back just in case. This is why I wrote my take on the equation. This problem was focused on ensuring I knew the basics.

4.8 #6

a. $\log_3(9) = 2$

↳ $3^x = 9 \rightarrow 3^2 = 3 \cdot 3 = 9$

b. $\log_2(64) = 6$

↳ $2^x = 64 \rightarrow 2 \cdot 2 = 4 \cdot 2 = 8 \cdot 2 = 16 \cdot 2 = 32 \cdot 2 = 64$

c. $\log_4\left(\frac{1}{64}\right) = -3$

$4^x = \frac{1}{64} \rightarrow 4^{-3} \rightarrow \frac{1}{4} \cdot \frac{1}{4} = \frac{1}{16} \cdot \frac{1}{4} = \frac{1}{64}$

In this example we use what we know about exponents to figure the answer. I can turn it to the other equation in order to find my answer. This problem focuses on solving log when its at log.