Warm Up

Review for your quiz on objectives 1.1 - 2.4

Gather materials: scrap paper, calculators, pencil

Critter Project Example

Sock Mice

- started with 2 mice (0, 2)
- I left them in my secret lab at Garinger.
- They escaped.
- On the next day, I found 7 of them (1, 7).

Step 2: Write the growth equation

$y = ae^{rt}$

$y = 2e^{rt}$ $\quad a_{\text{initial}} = 2$

$7 = 2e^{r(1)}$ $\quad$ secondary measure $= (1, 7)$

Solve for the rate

$\frac{7}{2} = e^{1r}$

$\ln(7/2) = 1r$

$1.253 = r$

rate of growth = 125.3% per day

EQUATION: $y = 2e^{1.253t}$

Step 3: Critical Mass

CM = the amount of critters that can live based on food supply.

- My sock mice need 2 red shoes to live
- There are 30,000 red shoes available in Charlotte.
- $CM = \frac{30,000}{2} = 15,000$ sock mice

Determine <u>when</u> population reaches CM

$$y = 2e^{1.253(t)}$$

$$15000 = 2e^{1.253t}$$

$$7500 = e^{1.253t}$$

$$\ln(7500) = 1.253t$$

$$\frac{\ln(7500)}{1.253} = t$$

$$\boxed{7.12 = t}$$

It takes 7.12 days for my sock mice to reach CM pop. of 15,000 mice.

<u>Threshold</u> = <u>2 times CM</u> = $2 \times 15000 = 30,000$

from rubric instructions

Find how long it takes to reach Threshold:

$$30,000 = 2e^{1.253t}$$

$$15000 = e^{1.253t}$$

$$\ln(15000) = 1.253t$$

$$\frac{\ln(15000)}{1.253} = t$$

$$\boxed{7.67 = t}$$

It takes 7.67 days to reach threshold.

Remember: project due on Tuesday!

No school on Monday!

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