Warm Up - Solve #1-4 with a calculator

1) $\ln(2x-3)=1$

$e^1 = 2x-3$ $x = 2.86$

2) $12 = 10^{x+5} - 7$

$19 = 10^{x+5}$

$\log_{10} 19 = x+5$ $x = -3.72$

3) $e^{2x} - 2 = 7$

$x = 1.1$ $e^{2x} = 9$

$\ln 9 = 2x$

4) You invest \$24,900 in an account which is compounded continuously at a rate of 8.3% per year. What will be the estimated value of your investment in 4 years?

$A = Pe^{rt}$

$24900 e^{.083 \cdot 4}$

34704.45

5) Evaluate: NO CALCULATOR

$$\log_9 \frac{1}{3} + 3\log_9 3 - \log_9 9$$

$\log_9 \frac{1}{3}$ $\log_9 3^3 - \log_9 9$

$9^x = \frac{1}{3}$ $-\frac{1}{2}$ $9^x = 27$ $\frac{3}{2} - 1 = \bigcirc$

$3^{2x} = 3^{-1}$ $3^{2x} = 3^3$

$2x = -1$ $2x = 3$

$x = -\frac{1}{2}$ $x = \frac{3}{2}$

Mar 16-10:49 AM

CHECK HW 8.6 Part 1 p. 472

1. $\ln 125$ **2.** $\ln 18$ **3.** $\ln 4$

4. $\ln 40{,}960$ **5.** $\ln \frac{1}{81}$ **6.** $\ln 1$

7. $\ln \frac{m^5}{n^3}$ **8.** $\ln \frac{\sqrt[3]{xy}}{z^4}$ **9.** $\ln \frac{a\sqrt{c}}{b^2}$

15. 0.14   17. 1489   19. +/- 11.59

21. ± 2.241 23. 2.9 $\cdot$ 25. 2.4   27. 1.24

31. 1   **32.** 2   **33.** 10

34. 10   **35.** 0   **36.** $\frac{1}{4}$

55. x = 542.31   **56.** x = 1   **58.** x = 81.29

Mar 14-12:06 PM

Word Problems involving Logs

Mar 12-10:43 AM

The population of Boringville is 800 dull folks. The number of residents is decreasing at a rate of 32% per year. How many years will it take before the number of inhabitants is 250 people?

3 years

Move picture for answer.

$A = P(1 \pm r)^t$

$A = 250 \qquad r = .32$
$P = 800 \qquad t = ?$

What variable in the equation are you trying to find?

Pull

$250 = 800(1-.32)^t$

$\dfrac{250}{800} = \dfrac{800}{800}(.68)^t$

$0.3125 = .68^t$

$\log_{.68} .3125 = t$

$t \approx 3 \text{ years}$

Feb 10-9:43 AM

2

An initial investment of $200 is worth $315.24 when the interest rate is 6.7% per year, and not withdrawing any money. How long has the money been invested?

Move picture for answer.

$A = 315.24 \quad r = .067$

$P = 200 \quad t = ?$

$315.24 = 200(1 + .067)^t$

$\dfrac{315.24}{200} = \dfrac{200(1.067)^t}{200}$

$1.5762 = 1.067^t$

$\log_{1.067} 1.5762$

$t = 7.01 \text{ years}$

7. years

What va
are you

Mar 16-11:02 AM

If $3000 is invested at 6% compounded continuously, then how long will is take for the inverstment to grow to $10,000? Round to the nearest whole number.

? Pull

? Pull

$A = Pe^{rt}$

$A = 10000 \quad r = .06$

$P = 3000 \quad t = ?$

$\dfrac{10000}{3000} = \dfrac{3000 e^{.06t}}{3000}$

$3.\overline{3} = e^{.06t}$

$.06t = \ln 3.\overline{3}$

$t = \approx 20 \text{ years}$

Pull for answer: 20 years

Mar 16-10:52 AM

3

GO COUGARS!

HOMEWORK 8.6 - Part 2
WB pg. 79 # 5, 7 and pg. 80-81 all

1. In an over-fished area, the catch of a certain fish is decreasing at an average rate of 8% per year. If this decline persists, how long will it take for the catch to reach half the amount before the decline? HINT: use $y = \frac{1}{2}$ and $a = 1$

2. Alex invests $2000 in an account that has a 6% annual rate of growth. When will the investment be worth $3600?

3. How many days will it take a culture of bacteria to increase from 2000 to 50,000 if the growth rate is 93.2% per day?

4. A global positioning satellite (GPS) system uses satellite information to locate ground position. Abel's surveying firm bought a GPS system for $12,500. The GPS depreciated by a fixed rate of 6% per year and is now worth $8600. How long ago did Abel buy the GPS system?

5. How many hours will it take a culture of bacteria to increase from 20 to 2000 if the growth rate per hour is 50%?

6. A piece of machinery valued at $250,000 depreciates at a fixed rate of 12% per year. After how many years will the value have depreciated to $100,000?

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7. The newest model of a certain brand of car cost $25,000. How many years ago would a similar car been purchased for $16,800 if the inflation rate was 5.1%

8. A computer system depreciates at an average rate of 4% per month. If the value of the computer system was originally $12,000, in how many months is it worth $7350?

9. An eight inch plant was planted in the spring. Sometime later, it had grown to 18 inches. If the growth rate is 10%, how many weeks has the plant been in the ground?

Confucius says, "He who sits on a tack ... "

S	R	E	E	A	T	S
5.1	11.4	6.0	0.9	7.2	15.3	6.8
S	T	A	H	E	H	P
12	0.8	8.3	4.2	1.5	10.1	9.2
R	O	U	I	N	S	T
4.9	2.1	8.5	1.3	2.9	8.0	11.3

Aug 29-11:17 AM

Attachments

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