. 1	Hon	ors Precalculus Applications of Logarithms & Exponentia	l Functions Name
,	YES	Calculator is permitted. Show your work and box your a	DSWERS when appropriate ROUNDING PULLES, Dougl
)	mon	ey to the nearest penny. Round Bacteria to nearest who	ole. Round any rate to the at least three decimal places. Do
,	not	round in the middle of a problem, only at the end of the	nrohlem Provide eyect values when requested
Γ	1.	Find the amount that results when \$1500 is invested	
ŀ		at 8% compounded monthly after a period of 14	2. Find the amount that results when \$375 is invested at 4% compounded continuously after a period of 3
		years.	years.
		* 4	Years.
		*	a.
1			
-			* * * * * * * * * * * * * * * * * * *
	3.	Find the principal needed now (present value) to get	4. Find the effective interest rate of interest for 8.5%
		\$13,000 after 5 years at 9% compounded quarterly.	compounded continuously.
1			2
-			
-			
f	5.	How long does it take for an investment to double in	6. How many years will it take for an initial investment
		value if it is invested at 3% compounded monthly?	of \$25,000 to grow to \$80,000? Assume a rate of 7%
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	interest compounded continuously.
		•	
			*
1			
+	7	A skillet is removed from an oven whose temperature	
	/.	is 450° and placed in a room whose temperature is	8. A culture of bacteria obeys the laws of uninhibited
		70°. After 5 minutes, the temperature of the skillet	growth.  a. Write a formula if 600 bacteria are present
		is 400°.	initially, and there are 790 after 1 hour.
			midally, and there are 750 after 1 flour.
		a. Write a formula to model the temperature of the	
		skillet after t seconds. Use an exact value for k.	
		,	
- 1			
			b. How many bacteria will be present after 12
			b. How many bacteria will be present after 12 hours?
,			present ditter 12
,		h Hawka will it be will the 1500a	present ditter 12
,		b. How long will it be until the skillet is $150^{\circ}$ ?	many additional trial de present ditter 12
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9.	A colony of bacteria grows according to the law of uninhibited growth where $N(t) = 100e^{0.054t}$ Where N is measured in grams and t is measured in days. a. Determine the initial amount of bacteria	10. A piece of charcoal is found to contain 25% of the carbon 14 that it originally had. When did the tree from which the charcoal came from die? Remember the half-life of Carbon 14 is about 5600 years. (Do not round any value until the end!)
	b. What is the growth rate of the bacteria?	
	c. What is the population after 5 days?	
	d. How long will it take for the population to reach 140 grams?	
11.	The normal healing of wounds can be modeled by an e	exponential function. If $A_0$ represents the original area of
	<ul><li>a. After how many days will the wound be half its ori</li><li>b. How long before the wound is 10% of its original s</li></ul>	
	b. How long before the would is 10% of its original s	ize.
12.	Solve. You do not have to show work if calculator is your method. $\log_2 x + \log_4 x = \log_3 (2-x)$	13. Solve. Round answer to three decimal places $e^x - \ln 5 = 2 - x^2$
14.	State the domain $y = \log_5(x^2 - 2x - 15)$	15. $f(x) = \log_7(7 - x)$ a. Solve $f(x) = 0$
		b. Evaluate $f(0)$

## 11/26/2018

Honors Precalculus Applications of Logarithms & Exponential Functions Name

KEY 2018

Find the amount that results when \$375 is invested

YES Calculator is permitted. Show your work and box your answers when appropriate. ROUNDING RULES: Round money to the nearest penny. Round Bacteria to nearest whole. Round any rate to the at least three decimal places. Do not round in the middle of a problem, only at the end of the problem. Provide exact values when requested.

Find the amount that results when \$1500 is invested at 8% compounded monthly after a period of 14 1500 ( | + 108) 168

84580.23

at 4% compounded continuously after a period of 3 375 6 422.81

Find the principal needed now (present value) to get \$13,000 after 5 years at 9% compounded quarterly.

 $13,000 = P(1 + \frac{.09}{11})^{20}$ P8330.61

Find the effective interest rate of interest for 8.5% compounded continuously.

> r=1-e = 1-e.085 .088717067

How long does it take for an investment to double in value if it is invested at 3% compounded monthly?

 $2 = (1 + \frac{03}{12})^{12t}$ |n2 = 12t In(1+103) 七公23.133775 About 23,134 years

How many years will it take for an initial investment of \$25,000 to grow to \$80,000? Assume a rate of 7% interest compounded continuously.

80,000 = 25000 p.07 t

About 16.616 years

7. A skillet is removed from an oven whose temperature is  $450^{\circ}$  and placed in a room whose temperature is  $70^{\circ}$ . After 5 minutes, the temperature of the skillet T(5)=Ts+(To-Te)

a. Write a formula to model the temperature of the skillet after t seconds. Use an exact value for k. T(+) = 70 + (450-70)e-Kt

- A culture of bacteria obeys the laws of uninhibited
  - Write a formula if 600 bacteria are present initially, and there are 790 after 1 hour.

790 = 600 e

8.8717

 $T(t) = 70 + 380 e^{-Kt} use(5, 400)$  $400 = 70 + 380e^{-5K}$ In (33/8) = K (T(1)=70+3800

How many bacteria will be present after 12 hours?

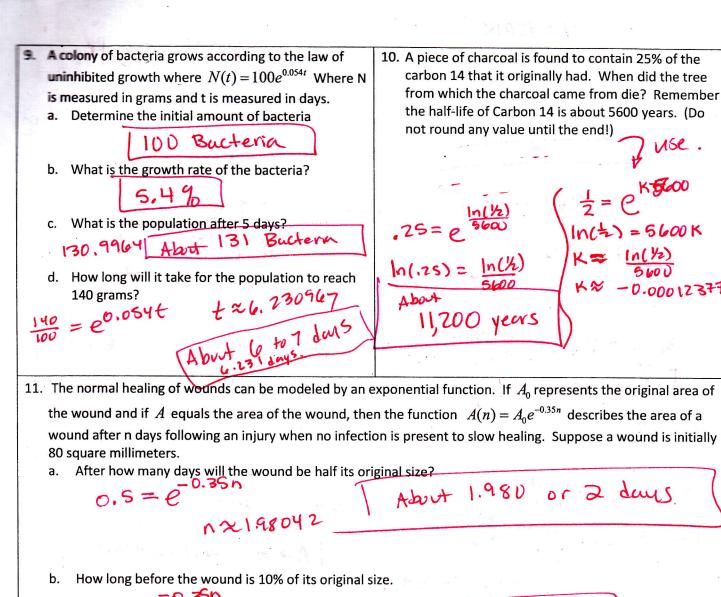
16287.75925

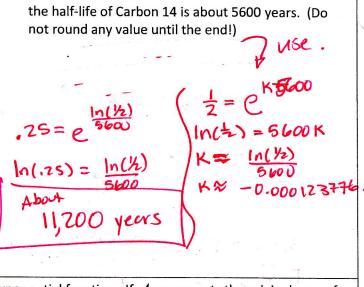
About 16288 bactera

b. How long will it be until the skillet is  $150^{\circ}$ ?

150 = 70 + 3 80 (33) t |n(4) = +, 2 |n(33)

55.22257 About 55.223 minutes





the wound and if A equals the area of the wound, then the function  $A(n) = A_0 e^{-0.35n}$  describes the area of a wound after n days following an injury when no infection is present to slow healing. Suppose a wound is initially

About 1.980 or 2 days

0.10 = P About 6.579 days or 7 days m(1) = -0.35 n nach 5788

- 12. Solve. You do not have to show work if calculator is your method.  $\log_2 x + \log_4 x = \log_3 (2 - x)$ X = 1in calculator
- 14. State the domain  $y = \log_s(x^2 2x 15)$ x2-2x-15 70

$$(x-5)(x+3) > 0$$
  
 $(x-5)(x+3) > 0$   
 $(x-3) \cup (5,\infty)$ 

- 13. Solve. Round answer to three decimal places  $e^x - \ln 5 = 2 - x^2$  $Y_1 = e^{x} - \ln S$  $y_2 = 2 - x^2$ 15.  $f(x) = \log_7(7 - x)$ 
  - a. Solve f(x) = 0 $0 = \log_{7}(7-x) (x=6)$ 
    - b. Evaluate f(0)109- (7-0)