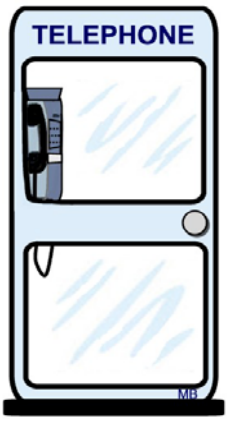
Exponential Equations

Name ___**ANSWERS**_____

Directions: Answer each question and find the answer in the chart at the end. The letter corresponding to each answer is used to decipher the message. All answers should be rounded to the nearest hundredth, unless otherwise specified.



I		**A**	**M**		**I**	**N**		**A**		**P**	**H**	**O**	**N**	**E**										
1		4	6		1	12		4		5	7	17	12	3										
		B	**O**	**O**	**T**	**H**		**A**	**T**			**T**	**H**	**E**										
		15	17	17	8	7		4	8			8	7	3										
C	**O**	**R**	**N**	**E**	**R**		**O**	**F**			**W**	**A**	**L**	**K**										
11	17	9	12	3	9		17	10			13	4	16	2										
A	**N**	**D**		**D**	**O**	**N**	**'**	**T**		**W**	**A**	**L**	**K**	**!**										
4	12	14		14	17	12		8		13	4	16	2											

1. Solve for *x*: $5^{3x+4} = 5^{5x-4}$ **4**

2. Solve for *x*: $3^{2x+5} = 9^{4x+1}$ **1/2**

3. Solve for *x*: $4^{x} = \dfrac{1}{16}$ **-2**

4. Is there a negative integer that satisfies the equation $2^{2x} = \left(\dfrac{1}{2}\right)^{x+3}$? (yes or no)

5. If $a = e^{1.5} - 1$, what is the numerical value of *a*? **3.28**

6. Find the value of *x* if $2^{-2x} = 15$. **-1.95**

7. If $4\left(3^{x}\right) = 972$, find the value of *x*. **5**

8. Solve for *x*: $5\left(10^{x}\right) = 180$ **1.56**

9. What value of *x* satisfies the equation: $\left(\dfrac{3}{4}\right)^{x} = \dfrac{27}{64}$ **3**

10. In the equation $-15 + 2e^{x} = 7$, what is the exact value of *x* that satisfies the equation?
ln 11

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11. In $e^{x^2+5x-6} = e^{x^2+4x-12}$, what value(s) makes the equation true? **-6**

12. Find the value(s) of x that satisfies the equation: $e^{5x} = e^{x^2+4}$ **{1,4}**

13. Find the exact solution(s) to the equation $e^{2x} + e^{x} - 12 = 0$. **ln 3**

14. A ball is dropped and bounces on the floor. The height in inches, $h(x)$, of each successive bounce is represented by the equation $h(x) = 30(0.6)^x$, where x represents the number of the bounce. How much higher, in inches, is the first bounce than the second bounce? **7.2**

15. The population of coyotes in a certain county is represented by $P(t) = 120(0.95)^t$, where t represents the number of years since 2000. Using this formula, how many coyotes were in the county in the year 2004? **97**

16. Using the formula shown at the right, how much money would accumulate in a savings account after 10 years, if the account started with \$2000 at 6% interest compounded monthly? **3638.79**

$$A = P\left(1+\frac{r}{n}\right)^{nt}$$
A = Accumulated \$
P = Starting Amount \$
r = Annual Rate of Interest
n = # of Interest Periods in a Year
t = Length of Time in Years

17. Using the formula shown at the right for continuous compounding, how much money would result in depositing \$4000 for 8 years at an interest rate of $5\frac{1}{2}\%$ compounded continuously? **6210.83**

$$A = Pe^{rt}$$
A = Accumulated \$
P = Starting Amount \$
r = Annual Rate of Interest
t = Length of Time in Years

Letter Key: Use the letter that corresponds to each answer.

A *Yes*	**B** 97	**C** –6	**D** 7.2	**E** -2	**F** ln11	**G** {4,ln3}	**H** 5
I 4	**K** $\frac{1}{2}$	**L** 3638.79	**M** –1.95	**N** {1,4}	**O** 6210.83	**P** 3.48	**R** 3
S *No*	**T** 1.56	**V** 3644.24	**W** ln 3	Look out!! There are more answers than questions!!			

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