

NAME: \_\_\_\_\_

*P.I. A2.A.28: Solve a logarithmic equation by rewriting as an exponential equation*

1. Write a logarithmic equation and solve it.

2. Describe the relationship between the number  $e$  and the expression  $\left(1 + \frac{1}{n}\right)^n$ .

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3. Write a real-life problem that could be solved using the formula for interest compounded continuously,  $A = Pe^{rt}$ . Then solve it.

4. Explain how natural logarithms are different from and similar to common logarithms.

5. Make up a natural logarithm equation and solve it.

[1] Answers may vary. Sample:  $\log x + \log 2 = 5$ ;  $\log 2x = 5$ ;  $2x = 10^5$ ;  $2x = 100,000$ ;  $x = 50,000$ .

[2] As  $n$  gets larger, the value of the expression gets closer and closer to the value of  $e$ .

Answers may vary. Sample: How many years will it take to double an investment of any amount at 6%

[3] interest compounded continuously? 11.6 years

Natural logarithms are the inverse of  $y = e^x$ ; common logarithms are the inverse of  $y = 10^x$ ; the product property, quotient property and the power property are true for both natural logarithms and common

[4] logarithms.

[5] Answers may vary. Sample:  $e^{2x} + 2 = 100$ ;  $x = 2.29$