

Watch. Practice. Understand. | Lesson 113

Algebra II Honors Chapter 6 Exponential and Logarithmic Functions Part I

Watch the matching video: <https://www.youtube.com/watch?v=Wpl4Rq9PzvE>

Practice focus: Exponential functions and models

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Solve $3^{(x + 1)} = 81$.

02 A population starts at 500 and doubles every 3 hours. Find its size after 9 hours.

03 An item worth \$800 loses 15% of its value per year. Find its value after 2 years.

04 Find the y-intercept, horizontal asymptote and range of $y = 2^x - 3$.

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Practice focus: Logarithms and their properties

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

05 Evaluate $\log$ base 2 of 32 and $\ln(e^3)$.

06 Expand $\ln(x^2\sqrt{y}/z)$, assuming $x, y, z > 0$.

07 Condense $2 \log x - \log 3$, for $x > 0$.

08 Express $\log$ base 5 of 17 using natural logarithms.

Worked answers | Lesson 113

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01 Solve $3^{(x+1)} = 81$.

$$81 = 3^4, \text{ so } x + 1 = 4 \text{ and } x = 3.$$

02 A population starts at 500 and doubles every 3 hours. Find its size after 9 hours.

$$P(t) = 500(2)^{(t/3)}. P(9) = 500(8) = 4000.$$

03 An item worth \$800 loses 15% of its value per year. Find its value after 2 years.

$$V = 800(0.85)^2 = \$578.$$

04 Find the y-intercept, horizontal asymptote and range of $y = 2^x - 3$.

At $x = 0$, $y = -2$. Asymptote $y = -3$; range $(-3, \text{infinity})$.

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Practice focus: Logarithms and their properties

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05 Evaluate log base 2 of 32 and $\ln(e^3)$.

$2^5 = 32$, so the first value is 5; $\ln(e^3) = 3$.

06 Expand $\ln(x^2\sqrt{y/z})$, assuming $x, y, z > 0$.

$2 \ln x + (1/2) \ln y - \ln z$, using product, quotient and power rules.

07 Condense $2 \log x - \log 3$, for $x > 0$.

$\log(x^2) - \log 3 = \log(x^2/3)$.

08 Express log base 5 of 17 using natural logarithms.

Change of base: $\ln(17)/\ln(5)$, approximately 1.7604.