

Watch. Practice. Understand. | Lesson 131

Algebra II Honors Midterm Study Packet Part II

Watch the matching video: <https://www.youtube.com/watch?v=tL1qmMxAM5w>

Practice focus: Quadratic equations and graphs

Related course review; confirm topics with your teacher.

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

01 Solve $x^2 - 7x + 12 = 0$.

02 Solve $x^2 + 4x - 1 = 0$ exactly.

03 Find the vertex, axis and minimum of $y = 2(x - 3)^2 - 8$.

04 A rectangle has area 60 m^2 and length 4 m more than width. Find its dimensions.

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Practice focus: Rational expressions and graphs

Related course review; confirm topics with your teacher.

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

05 Simplify $(x^2 - 9)/(x^2 - x - 6)$, retaining restrictions.

06 Find asymptotes of $f(x) = (2x + 1)/(x - 3)$.

07 Find the hole in $f(x) = (x^2 - 4)/(x - 2)$.

08 Solve $1/x + 1/(x + 1) = 3/2$.

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Watch the matching video: <https://www.youtube.com/watch?v=tL1qmMxAM5w>

Practice focus: Logarithms and their properties

Related course review; confirm topics with your teacher.

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

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

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

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

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

Worked answers | Lesson 131

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01 Solve $x^2 - 7x + 12 = 0$.

Factor: $(x - 3)(x - 4) = 0$. Roots: 3 and 4.

02 Solve $x^2 + 4x - 1 = 0$ exactly.

Complete the square: $(x + 2)^2 = 5$. Thus $x = -2 \pm \sqrt{5}$.

03 Find the vertex, axis and minimum of $y = 2(x - 3)^2 - 8$.

Vertex (3, -8); axis $x = 3$. Since $2 > 0$, minimum is -8.

04 A rectangle has area 60 m^2 and length 4 m more than width. Find its dimensions.

$w(w + 4) = 60$, so $(w + 10)(w - 6) = 0$. Reject -10: width 6 m, length 10 m.

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05 Simplify $(x^2 - 9)/(x^2 - x - 6)$, retaining restrictions.

Factor and cancel $x - 3$: $(x + 3)/(x + 2)$, with $x \neq 3$ and $x \neq -2$.

06 Find asymptotes of $f(x) = (2x + 1)/(x - 3)$.

Denominator zero gives vertical asymptote $x = 3$. Equal degrees give horizontal asymptote $y = 2$.

07 Find the hole in $f(x) = (x^2 - 4)/(x - 2)$.

For $x \neq 2$, $f(x) = x + 2$. Missing point: $(2, 4)$.

08 Solve $1/x + 1/(x + 1) = 3/2$.

Exclude 0, -1. Multiply by $2x(x + 1)$: $2(2x + 1) = 3x(x + 1)$. Roots: $x = 1$ or $-2/3$; both check.

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Practice focus: Logarithms and their properties

Related course review; confirm topics with your teacher.

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

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

10 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.

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

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

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

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