Watch. Practice. Understand. | Lesson 181

The Secret of Getting an A on the Pre Cal Midterm

Watch the matching video: https://www.youtube.com/watch?v=VuddK77pbOo

Practice focus: Functions, composition and piecewise rules

Related course review; confirm topics with your teacher.

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

01 For $f(x) = x^2 - 3x$, find $f(-2)$.

02 If $f(x) = 2x + 1$ and $g(x) = x^2$, find $f(g(3))$ and $g(f(3))$.

03 For $f(x) = x + 2$ when $x < 1$, and $f(x) = x^2$ when $x >= 1$, find $f(0)$, $f(1)$, $f(2)$.

04 Find the domain of $f(x) = \sqrt{(x - 2)/(x - 5)}$.

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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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The Secret of Getting an A on the Pre Cal Midterm

Watch the matching video: https://www.youtube.com/watch?v=VuddK77pbOo

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 181

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Practice focus: Functions, composition and piecewise rules

Related course review; confirm topics with your teacher.

01 For $f(x) = x^2 - 3x$, find $f(-2)$.

$f(-2) = 4 + 6 = 10$.

02 If $f(x) = 2x + 1$ and $g(x) = x^2$, find $f(g(3))$ and $g(f(3))$.

$g(3) = 9$, so $f(9) = 19$. $f(3) = 7$, so $g(7) = 49$.

03 For $f(x) = x + 2$ when $x < 1$, and $f(x) = x^2$ when $x >= 1$, find $f(0)$, $f(1)$, $f(2)$.

Use the first rule at 0 and the second at 1 and 2: 2, 1, 4.

04 Find the domain of $f(x) = \sqrt{(x - 2)}/(x - 5)$.

Require $x >= 2$ for the radical and $x != 5$ for the denominator. Domain: [2, 5) union (5, infinity).

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Practice focus: Rational expressions and graphs

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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.

Worked answers | Lesson 181

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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.