

Watch. Practice. Understand. | Lesson 205

Pre Cal Honors Chapter 1 and 2 Lecture Part III

Watch the matching video: <https://www.youtube.com/watch?v=cdXYL98TLkI>

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 $x \geq 1$, 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: Graph transformations

Related course review; confirm topics with your teacher.

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

05 Describe $y = -2(x - 3)^2 + 1$ relative to $y = x^2$.

06 Find the endpoint and domain of $y = \sqrt{x + 4} - 2$.

07 For $y = |x - 2| + 3$, find the minimum and x-intercepts.

08 A point $(2, 5)$ lies on $y = f(x)$. Where does it move on $y = 3f(x - 1) - 4$?

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Practice focus: Quadratic equations and graphs

Related course review; confirm topics with your teacher.

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

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

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

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

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

Worked answers | Lesson 205

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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 $g(f(3))$.

$$g(3) = 9, \text{ so } f(9) = 19. \quad f(3) = 7, \text{ so } g(7) = 49.$$

03 For $f(x) = x + 2$ when $x < 1$, and $f(x) = x^2$ when $x \geq 1$, 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 $x \geq 2$ for the radical and $x \neq 5$ for the denominator. Domain: $[2, 5)$ union $(5, \text{infinity})$.

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05 Describe $y = -2(x - 3)^2 + 1$ relative to $y = x^2$.

Shift right 3, stretch vertically by 2, reflect across the x-axis, and shift up 1.

06 Find the endpoint and domain of $y = \sqrt{x + 4} - 2$.

Endpoint $(-4, -2)$; require $x + 4 \geq 0$, so domain $[-4, \text{infinity})$.

07 For $y = |x - 2| + 3$, find the minimum and x-intercepts.

Minimum 3 at $x = 2$. There are no x-intercepts because $y \geq 3$.

08 A point $(2, 5)$ lies on $y = f(x)$. Where does it move on $y = 3f(x - 1) - 4$?

The x-coordinate increases by 1 and y becomes $3(5) - 4$. New point: $(3, 11)$.

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Practice focus: Quadratic equations and graphs

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

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

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

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

11 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.

12 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.