

All the Essential Functions and Graphs Student Must Know Before Taking Calculus

Lesson 252 | Calculus AB | Functions, composition and piecewise rules • Graph transformations

<https://www.youtube.com/watch?v=i7rHY7hSmOw>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

Let $f(x) = 7x + 3$ for $x < -5$, and $f(x) = x^2 + 4$ for $x \geq -5$. Find $f(-6)$, $f(-5)$, and $f(-4)$.

02

Describe the transformations from $y = \sqrt{x}$ to $y = -4\sqrt{x - (6)} + 12$. Give domain, range, and endpoint.

03

Let $f(x) = 2x + 9$ and $g(x) = x^2 - 7$. Find $(f \circ g)(x)$ and $(g \circ f)(2)$.

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04

Describe the transformations from $y = \sqrt{x}$ to $y = -7\sqrt{(x - (-5))} + 2$. Give domain, range, and endpoint.

05

Let $f(x) = 14x + 12$ and $g(x) = x^2 - 2$. Find $(f \circ g)(x)$ and $(g \circ f)(6)$.

06

Describe the transformations from $y = \sqrt{x}$ to $y = -2\sqrt{(x - (0))} + 9$. Give domain, range, and endpoint.

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01

Let $f(x) = 7x + 3$ for $x < -5$, and $f(x) = x^2 + 4$ for $x \geq -5$. Find $f(-6)$, $f(-5)$, and $f(-4)$.

Choose the rule from the input interval: $f(-6) = -39$; $f(-5) = 29$; $f(-4) = 20$. Equality uses the second rule.

02

Describe the transformations from $y = \sqrt{x}$ to $y = -4\sqrt{x - (6)} + 12$. Give domain, range, and endpoint.

Shift horizontally by 6, stretch vertically by 4, reflect across the x-axis, and move up 12. Domain $x \geq 6$; range $y \leq 12$; endpoint $(6, 12)$.

03

Let $f(x) = 2x + 9$ and $g(x) = x^2 - 7$. Find $(f \circ g)(x)$ and $(g \circ f)(2)$.

$f(g(x)) = 2(x^2 - 7) + 9 = 2 \cdot x^2 - 5$. $f(2) = 13$, so $g(f(2)) = 162$.

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04

Describe the transformations from $y = \sqrt{x}$ to $y = -7\sqrt{x - (-5)} + 2$. Give domain, range, and endpoint.

Shift horizontally by -5, stretch vertically by 7, reflect across the x-axis, and move up 2. Domain $x \geq -5$; range $y \leq 2$; endpoint $(-5, 2)$.

05

Let $f(x) = 14x + 12$ and $g(x) = x^2 - 2$. Find $(f \circ g)(x)$ and $(g \circ f)(6)$.

$f(g(x)) = 14(x^2 - 2) + 12 = 14x^2 - 16$. $f(6) = 96$, so $g(f(6)) = 9214$.

06

Describe the transformations from $y = \sqrt{x}$ to $y = -2\sqrt{x - (0)} + 9$. Give domain, range, and endpoint.

Shift horizontally by 0, stretch vertically by 2, reflect across the x-axis, and move up 9. Domain $x \geq 0$; range $y \leq 9$; endpoint $(0, 9)$.