Bell Ringer

Grab a large notecard - put your name on it:

Look in your notes and put:
~ all equations of a line (4 forms)
~ slope formula for a line
~ information about parallel & perpendicular lines
~ root form of a parabola
~ vertex form of a parabola

$y = mx + b$

$y - y_1 = m(x - x_1)$

~~$Ax + By = C$~~

~~$\frac{x}{a} + \frac{y}{b} = 1$~~

$m = \frac{y_2 - y_1}{x_2 - x_1}$

|| lines have same slope

⊥ lines have opposite reciprocal

$\frac{3}{4} \rightarrow -\frac{4}{3}$

parabolas

root form

$y = a(x - r_1)(x - r_2)$

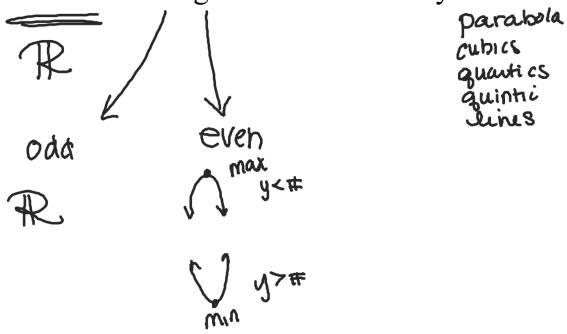
vertex

$y = a(x - h)^2 + k$

Agenda

Bell Ringer Answers ✓
Review: Domain & Range of Functions
Notes: Composites $f(g(x))$
Domain & Range of Composites
CW: If I were the teacher...
Closure
HW Time (?)

Domain & Range of Functions: Polynomials



Domain & Range of Functions: Square Roots

$y=\sqrt{x}$

no −#s in $\sqrt{\ }$

Domain: $x \geq 0$

$x \geq 0$

Range: plug back into original

$y \geq 0$

$y=\sqrt{x-7}$

D: $x-7 \geq 0$

$x \geq 7$

$y=\sqrt{x}+3$

D: $x \geq 0$

R: $y \geq 3$

Domain & Range: Rational Functions (Fractions)

cannot divide by 0

$\frac{1}{\otimes}$

$x \neq 0$

$\frac{1}{x+52}$

$x+52 \neq 0$

$x \neq -52$

$\frac{1}{x^2-4}$

$x^2-4 \neq 0$

$(x+2)(x-2) \neq 0$

$x \neq 2 \quad x \neq -2$

Domain & Range: Exponents & Logarithms

D: R

R: $y>0$

D: $x>0$

R: R

Composites

$f \circ g(x) \rightarrow f(g(x))$

→ x must be in the D of $g(x)$

→ $g(x)$ must be in the D of $f(x)$

$f(g(7)) = f(14)$

$f(x) = 4x^2 - 2x$ (R)

$4(14)^2 - 2(14)$

756

$g(x) = 2x$ (R)

$2 \cdot 7 = 14$

$f(g(x)) = f(2x)$

$4(2x)^2 - 2(2x)$

$4(4x^2) - 4x = 16x^2 - 4x$

$f(x) = x^2 + x$ $\mathbb{R}$ $\qquad g(x) = x + 1$ $\mathbb{R}$

$f(g(x)) = f(x+1)$

$= (x+1)^2 + (x+1)$

$= (x+1)(x+1) + x + 1$

$= x^2 + x + x + 1 + x + 1$

$= x^2 + 3x + 2$ $\mathbb{R}$

$g(f(x)) = g(x^2 + x) = (x^2 + x) + 1$

$x^2 + x + 1$ $\mathbb{R}$

$f(x) = x^3$ $\mathbb{R}$ $\qquad g(x) = \sqrt{x}$ $\quad x \geq 0$

$h(x) = x - 4$ $\mathbb{R}$ $\qquad j(x) = 2x$ $\mathbb{R}$

$f(h(x))$

$f(x-4)$

$(x-4)^3$

$(x^2 - 8x + 16)(x-4)$

$x^3 - 4x^2 - 8x^2 + 32x + 16x - 64$

$x^3 - 12x^2 + 48x - 64$

$\mathbb{R}$

$j(f(x))$

$j(x^3)$

$2x^3$

$\mathbb{R}$

$f(x) = x^3$ $\qquad g(x) = \sqrt{x}$

$h(x) = x - 4$ $\qquad j(x) = 2x$

$g(h(x))$

$g(x-4)$

$\sqrt{x-4}$

$x - 4 \geq 0$

$x \geq 4$

$j(g(x))$

$j(\sqrt{x}) = 2\sqrt{x}$

$x \geq 0$

$f(x) = x^3$ $\qquad g(x) = \sqrt{x}$

$h(x) = x - 4$ $\qquad j(x) = 2x$

$g(f(x))$

$g(x^3)$

$\sqrt{x^3}$

$x^3 \geq 0$

$x \geq 0$

$g(j(x)) = g(2x)$

$\sqrt{2x}$

$\sqrt{2x}$

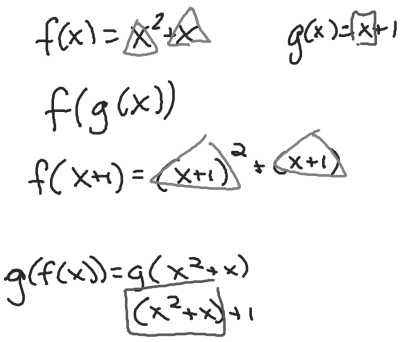
$2x \geq 0$

$x \geq 0$

If I were the teacher...

On a sheet of paper: write a question that would be a good quiz questions.
~ composite - create two functions
~ be able to find the domain of each
~ pick a combination
~ find the domain of the composite

Why is this a good quiz questions?
Too easy? Too hard? Take too long?



Closure

Think about the domain of a function.

Partner A: Explain how to find the domain of a square root. Victor

Partner B: Explain how to find the domain of a rational function. Marvin

Partner A: Explain how to find the domain of a exponential function. Tess

Partner B: Explain how to find the domain of a logarithmic function. Donnie

Be prepared to share