ERL MCR UNIT 3

January 16, 2018 4:10 PM

UNIT 3 MCR 3UI Exam Review

**Be able to graph our new functions,

$y = \sqrt{x}$ and $y = \frac{1}{x}$, and transformations of them!

1. Complete the chart

EQUATION	TYPE OF GRAPH	PARENT GRAPH	FUNCTION YES/NO	DOMAIN	RANGE
$2x - 3y = 5$	linear function	$y=x$	Yes	$\{x \mid x \in \mathbb{R}\}$	$\{y \mid y \in \mathbb{R}\}$
$y = \frac{3}{x+1}$	reciprocal function	$y=\frac{1}{x}$	Yes	$\{x \mid x \in \mathbb{R}, x \neq -1\}$	$\{y \mid y \in \mathbb{R}, y \neq 0\}$
$y = x^2 - 4$ V(0,-4)	quadratic function (parabola)	$y=x^2$	Yes	$\{x \mid x \in \mathbb{R}\}$	$\{y \mid y \in \mathbb{R}, y \geq -4\}$
$x = 5$ x=5	Vertical line	x=0	No	$\{5\}$	$\{y \mid y \in \mathbb{R}\}$
$y = \sqrt{x-2}$	root function	$y=\sqrt{x}$	Yes	$\{x \mid x \in \mathbb{R}, x \geq 2\}$	$\{y \mid y \in \mathbb{R}, y \geq 0\}$
$x^2 + y^2 = 9$	circle	$x^2+y^2=r^2$	No	$\{-3 \leq x \leq 3\}$	$\{-3 \leq y \leq 3\}$
$y = 2^x$	Exponential Function	$y=b^x$ b>1	Yes	$\{x \mid x \in \mathbb{R}\}$	$\{y \mid y \in \mathbb{R}, y > 0\}$
$y = 3\sin x$	Sinusoidal Function	$y=\sin x$	Yes	$\{x \mid x \in \mathbb{R}\}$	$\{-3 \leq y \leq 3\}$
$y = \lvert x \rvert + 3$	absolute value function	$y=\lvert x \rvert$	Yes	$\{x \mid x \in \mathbb{R}\}$	$\{y \mid y \in \mathbb{R}, y \geq 3\}$

2. Determine the equation of the inverse.

a) $f(x) = (x+1)^2 - 2$

for $f^{-1}(x)$,

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

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

$y+1 = \pm\sqrt{x+2}$

$y = \pm\sqrt{x+2} - 1$

$\therefore f^{-1}(x) = \pm\sqrt{x+2} - 1$

b) $f(x) = 2x^2 - 3$

for $f^{-1}(x)$,

$2y^2 - 3 = x$

$2y^2 = x+3$

$y^2 = \frac{x+3}{2}$

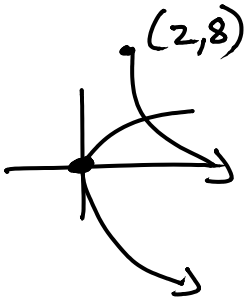
$y = \pm\sqrt{\frac{x+3}{2}}$

$\therefore f^{-1}(x) = \frac{\pm\sqrt{x+3}}{\sqrt{2}}$

3. Graph $y = -3\sqrt{x-2}+8$

Domain: $\{x | x \in \mathbb{R},\ x \geq 2\}$

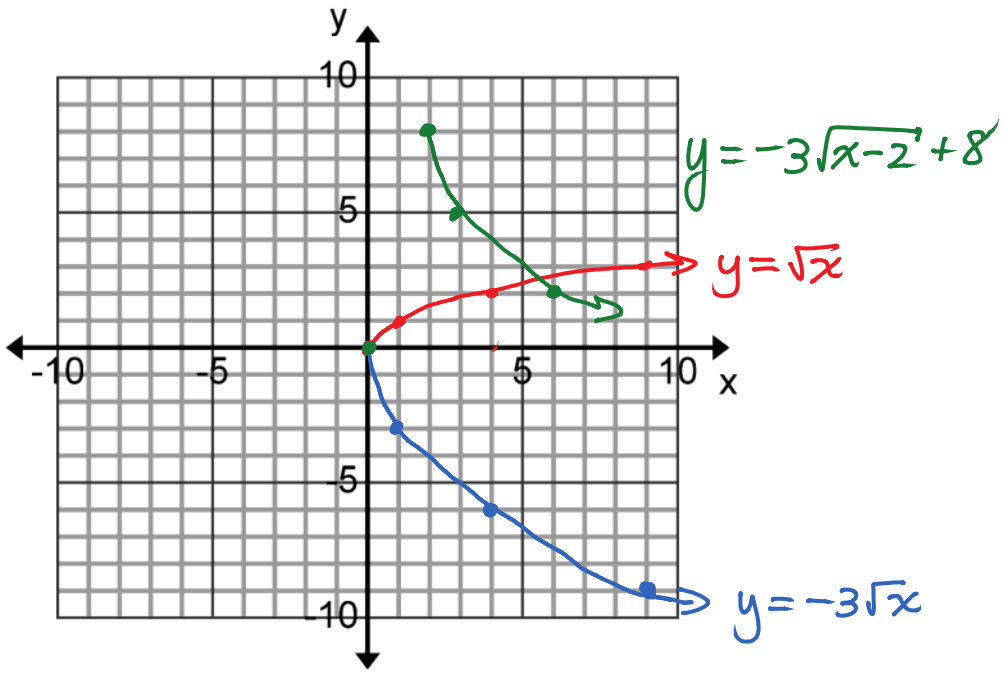
Range: $\{y | y \in \mathbb{R},\ y \leq 8\}$



First graph: $y = \sqrt{x}$

Second graph: $y = -3\sqrt{x}$

Final graph: $y = -3\sqrt{x-2}+8$



Also, Unit 4 today!