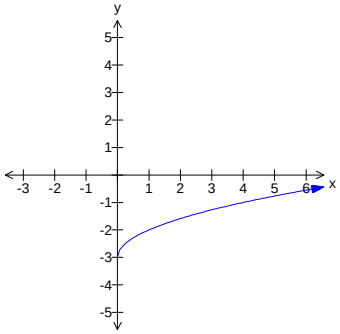
Mathematics 3200 Unit: Radical Functions Solutions

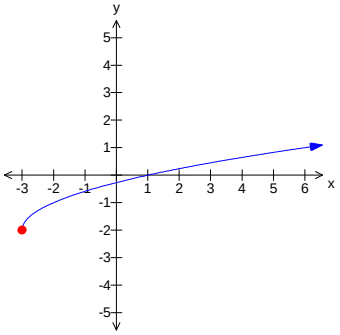
You should be able to:

1. Sketch the following. State the domain and range of each.

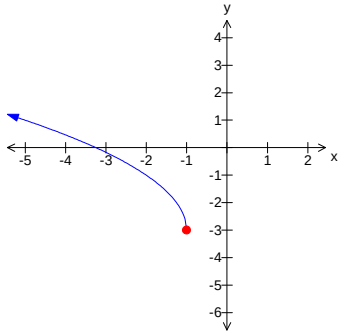
a. $y=\sqrt{x}-3$



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



c. $y=2\sqrt{-(x+1)}-4$



2. Write the radical function that results from applying each set of transformations to the graph $y=\sqrt{x}$.

(A) vertical stretch by a factor of 2, reflection in x-axis, a translation of 4 units right and 1 units down.

$y=-2\sqrt{(x-4)}-1$

(B) vertical stretch by a factor of 3, horizontal stretch by a factor of $\frac{1}{4}$, reflection in y-axis, translation 6 units to the left.

$y=3\sqrt{-4(x+6)}$

3. If $f(x)=2x+3$ and *x=4*, what is the corresponding y value on the graph of $y=\sqrt{f(x)}$?

$f(4)=11 \quad \therefore \sqrt{f(4)}=\sqrt{11}$

4. What is the domain and range of $y=-\sqrt{2(x-1)}$

$2(x-1)\geq 0$

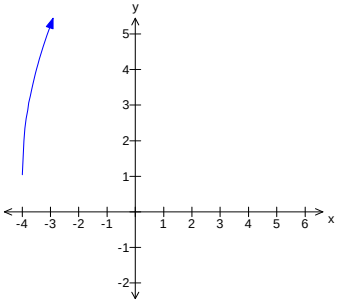
$x-1\geq 0$

$x\geq 1$

$y\leq 0$

5. State the mapping rule and sketch the graph of $y-1=3\sqrt{2x+8}$.

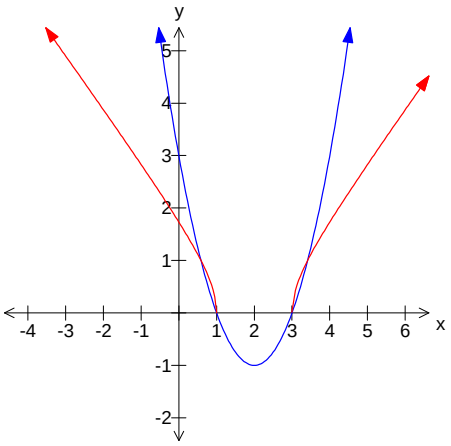
$(x,y)\rightarrow\left(\frac{1}{2}x-4,3y+1\right)$



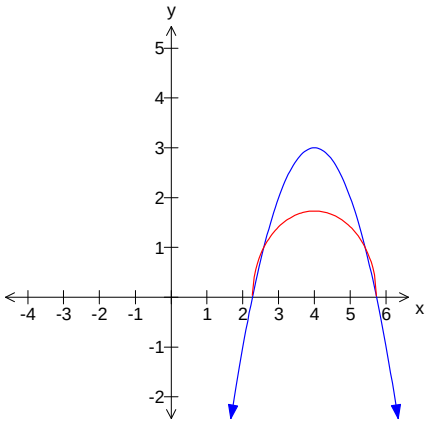
6 State all of the invariant points for the graph of $f(x)=x^2-x$ and $y=\sqrt{f(x)}$?

7. Given the graph of $y=f(x)$, sketch the graph of $y=\sqrt{f(x)}$ and state domain and range.

(A)



(B)



8. State the domain and range of $y=f(x)$ and $y=\sqrt{f(x)}$ for the following:

(A) $f(x)=x^2-2$

$x\in R$
$y\geq -2$

$x\in\left[-\infty,-\sqrt{2}\right]\cup\left[\sqrt{2},\infty\right]$
$y\geq 0$

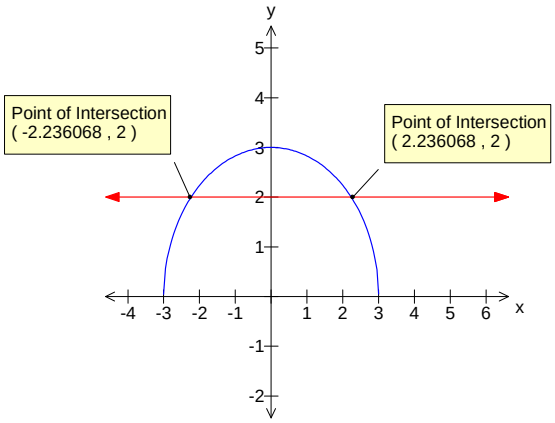
(B) $f(x)=-x^2+2x+8$

$x\in R$
$y\leq 11$

$x\in[-2,4]$
$y\in\left[0,\sqrt{11}\right]$

9. Solve graphically: (estimate if necessary)

(A) $\sqrt{9-x^2}=2$



(B) $\sqrt{x-4}+1=x$