1. Which function best represents the graph shown below?

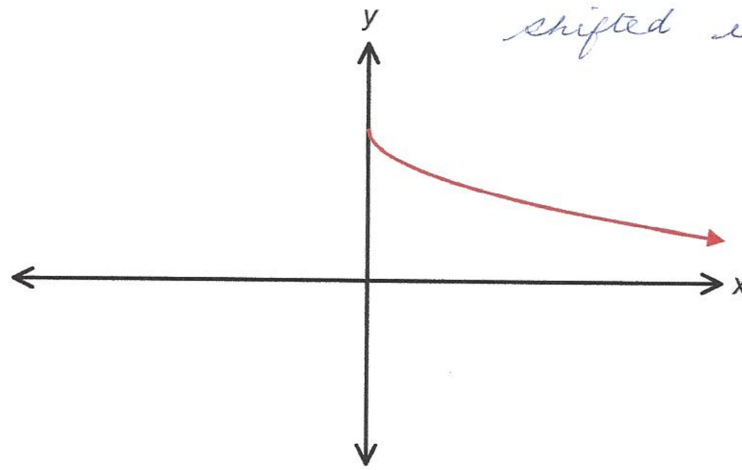
$y=\sqrt{x}$ reflected over x axis and shifted upwards

A) $y=\sqrt{-x}-3$

B) $y=\sqrt{-x}+3$

C) $y=-\sqrt{x}-3$

D) $y=-\sqrt{x}+3$



2. The graph of the function $y=\sqrt{x}$ is stretched horizontally by a factor of 3 and translated 4 units left. What is the domain of the transformed function?

A) $x \mid x \geq -4, x \varepsilon R$

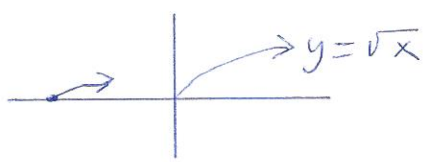
B) $x \mid x \geq -\frac{4}{3}, x \varepsilon R$

C) $x \mid x \leq -3, x \varepsilon R$

D) $x \mid x \leq -4, x \varepsilon R$

$HS = 3$

$HT = 4$ Lft



$x \geq -4$

3. If $f(x)=3x+1$, which point is on the graph of $y=\sqrt{f(x)}$?

A) (0,0)

B) (0,1)

C) (1,0)

D) (1,1)

$f(x) = 3x+1$

$(0,1)$

$y=\sqrt{3x+1}$

$(0,1)$

4. Which function has a range of $y \mid y \geq 0, y\varepsilon R$?

it cannot have a reflection over x-axis

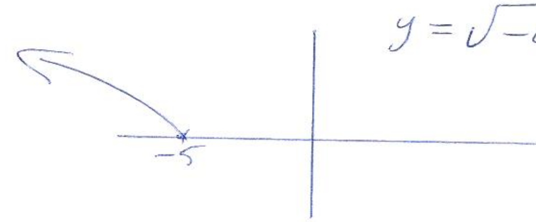
A) $y = -\sqrt{x-5}$

B) $y = \sqrt{x} - 5$ shift down 5

C) $y = \sqrt{-(x+5)}$

D) $y = \sqrt{x} + 5$ shift up 5

$y = \sqrt{-(x+5)}$



5. 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 3, reflection in x-axis, a translation of 4 units right and 2 units down.

$y = -3\sqrt{x-4} - 2$

(B) vertical stretch by a factor of 3, horizontal stretch by a factor of $\frac{1}{2}$, reflection in x and y-axis, translation 6 units to the left.

$y = -3\sqrt{-2(x+6)}$

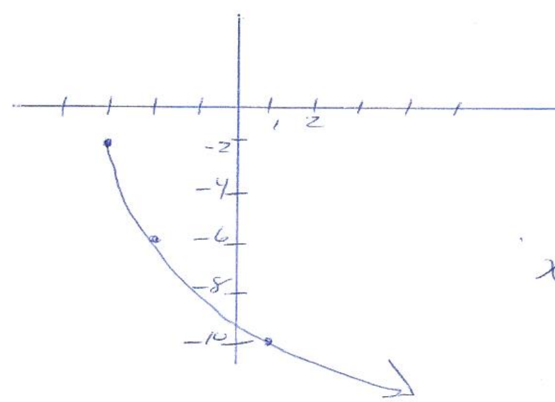
6. State the mapping rule and sketch the graph of $y = -4\sqrt{x+3} - 2$.

$(x, y) \rightarrow (x-3, -4y-2)$

x	y
0	0
1	1
4	2
9	3

$\rightarrow$

-3	-2
-2	-6
1	-10
6	-14



$x \geq -3$
$y \leq -2$

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

$f(x) = 0$
$f(x) = 1$

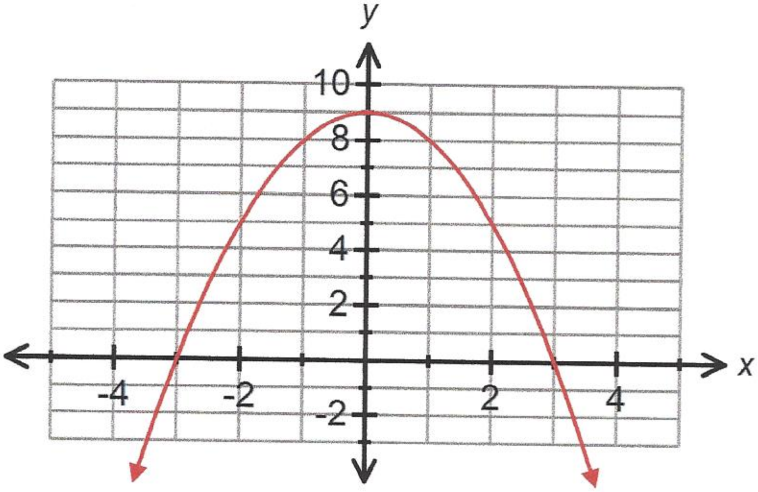
$6x^2 - x = 0$
$x(6x - 1) = 0$
$x = 0 \quad x = \frac{1}{6}$

$6x^2 - x = 1$
$6x^2 - x - 1 = 0$
$(3x+1)(2x-1) = 0$
$x = \frac{-1}{3} \quad x = \frac{1}{2}$

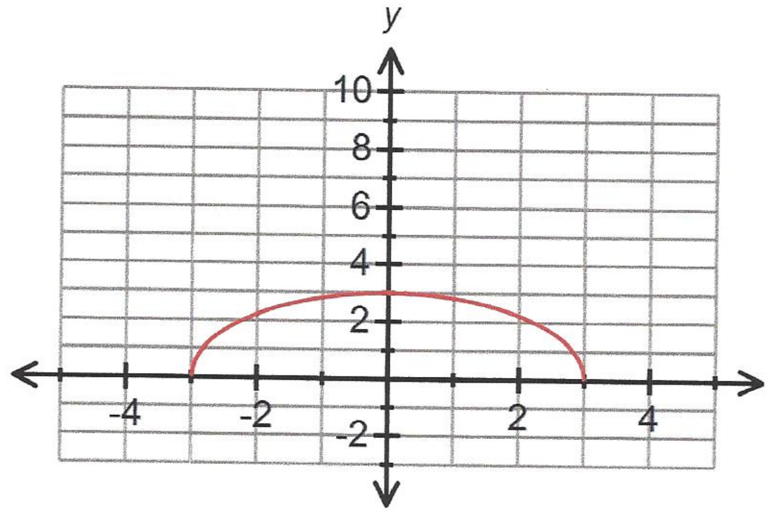
$(0,0) \; (\frac{1}{6}, 0) \; (-\frac{1}{3}, 1) \; (\frac{1}{2}, 1)$

8. Given the graph of $y = f(x)$, sketch the graph of $y = \sqrt{f(x)}$.

(A)

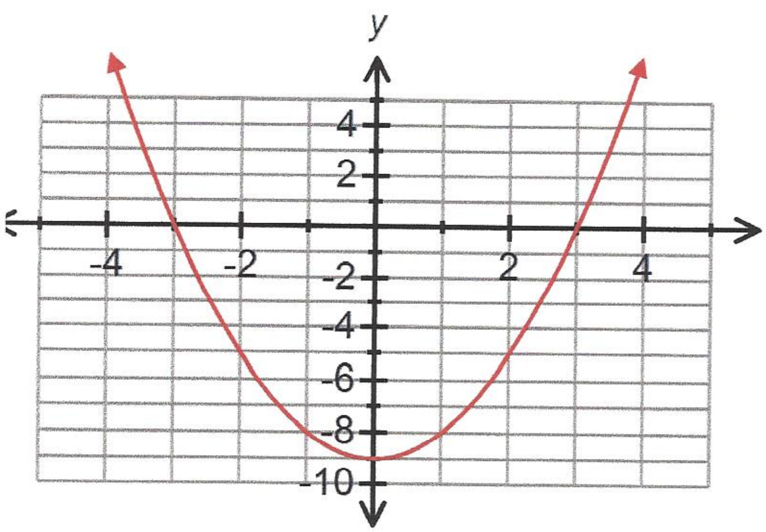


$y = f(x)$

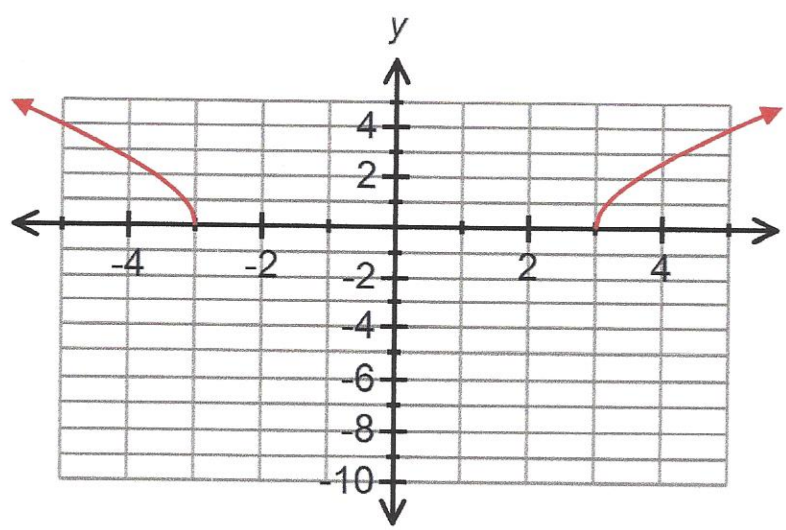


$y = \sqrt{f(x)}$

(B)



$y = f(x)$



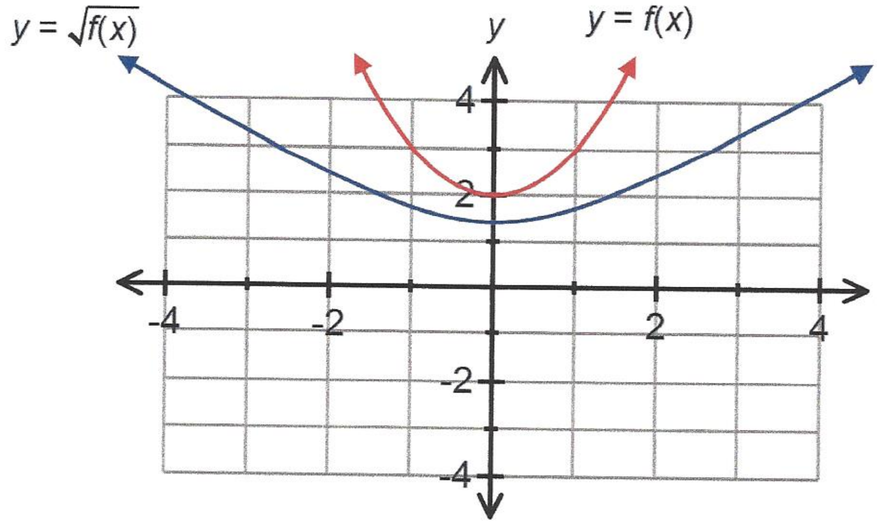
$y = \sqrt{f(x)}$

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

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

$y = x^2 + 2$
$V(0,2)$
No $x$int

Domain $x \in R$
Range $y \geq 2$



$y = \sqrt{x^2+2}$

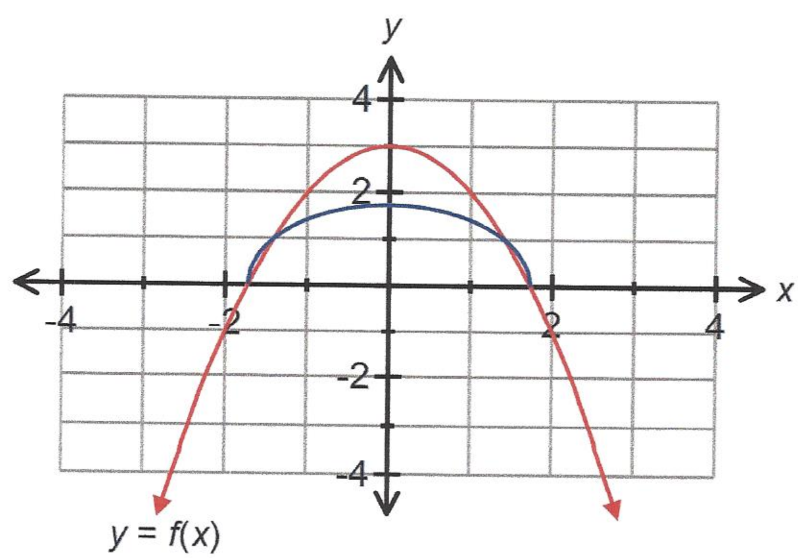
Domain $x \in R$
Range $y \geq \sqrt{2}$

(B) $f(x) = -x^2 + 3$

$y = -x^2 + 3$
$V(0,3)$

$x$int $0 = -x^2 + 3$
$x = \pm\sqrt{3}$

Domain $x \in R$
Range $y \leq 3$

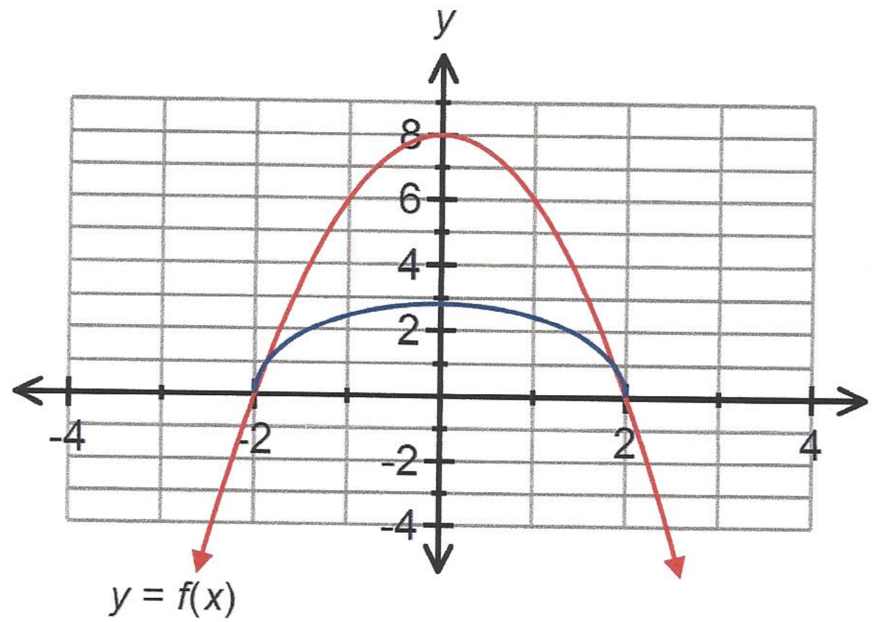


$y = \sqrt{-x^2+3}$

Domain: $-\sqrt{3} \leq x \leq \sqrt{3}$
or $[-\sqrt{3}, \sqrt{3}]$

Range $0 \leq y \leq \sqrt{3}$
or $[0, \sqrt{3}]$

(C) $f(x) = 8 - 2x^2$



$y = -2x^2 + 8$
$v(0, 8)$

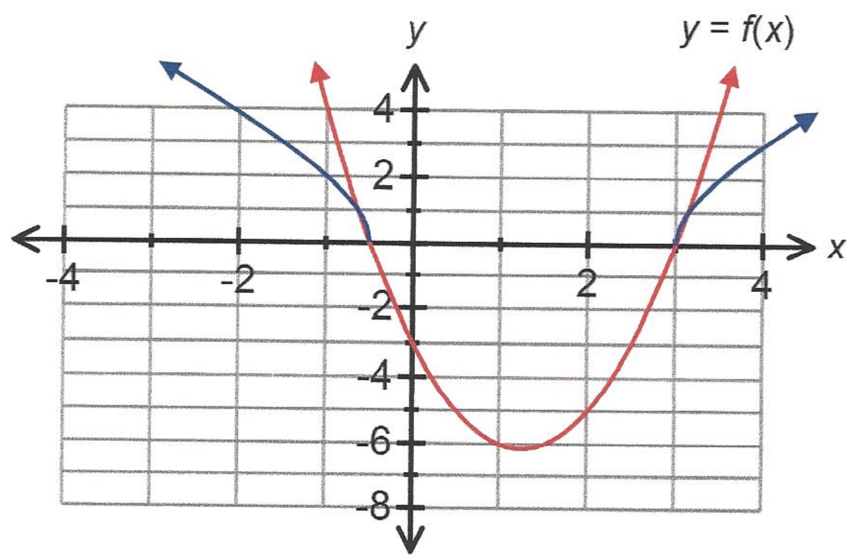
Xint $0 = -2x^2 + 8$
$2x^2 = 8$
$x = \pm 2$

Domain: $x \in \mathbb{R}$
Range $y \leq 8$

$y = \sqrt{-2x^2 + 8}$

Domain: $-2 \leq x \leq 2$
Range $0 \leq y \leq \sqrt{8}$

(D) $f(x) = 2x^2 - 5x - 3$



$y = 2x^2 - 5x - 3$
$\left.\begin{array}{l} x = \frac{-b}{2a} = \frac{5}{4} \\ y = -49/8 \end{array}\right\}$

Xint $0 = 2x^2 - 5x - 3$
$0 = (2x + 1)(x - 3)$
$x = -1/2 \quad x = 3$

Domain $x \in \mathbb{R}$
Range $y \geq -49/8$

$y = \sqrt{2x^2 - 5x - 3}$

Domain $x \geq 3, \quad x \leq -1/2$
Range $y \geq 0$

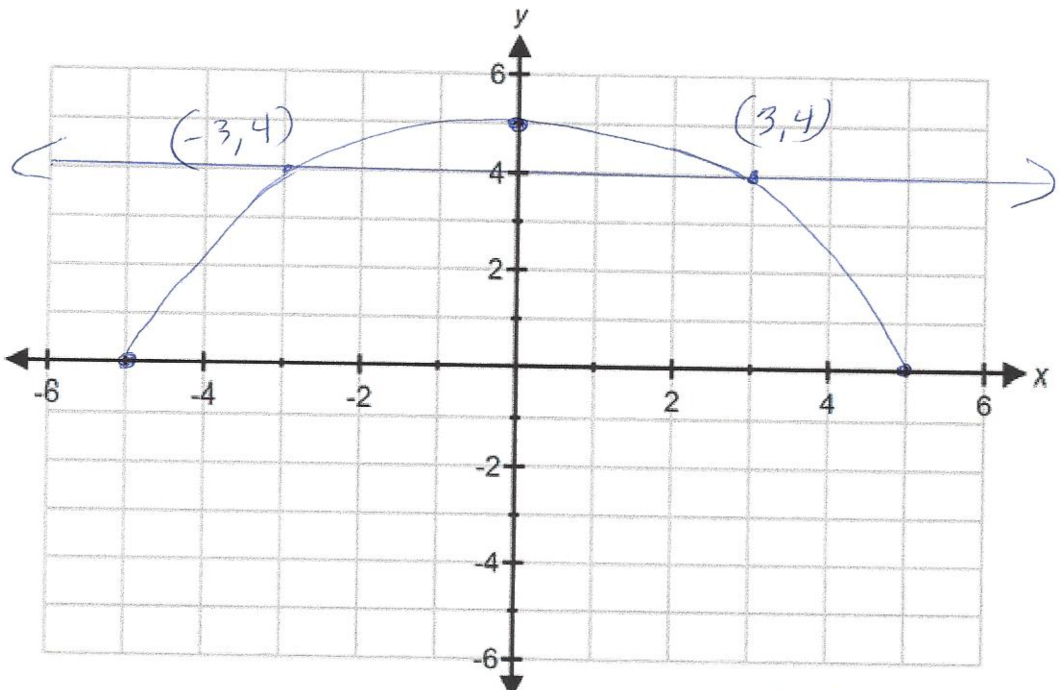
10. Solve graphically:

(A) $\sqrt{25-x^2} = 4$

$y = 4$

$y = \sqrt{25-x^2}$

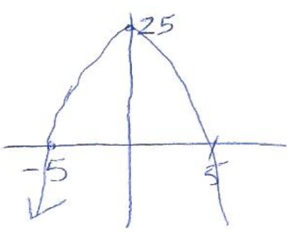
max$(0, 5)$



$f(x) = 25 - x^2$

$v(0, 25)$

xint ± 5



Check: $\sqrt{25-x^2} = 4$

$25 - x^2 = 16$

$9 = x^2$

$\pm 3 = x$

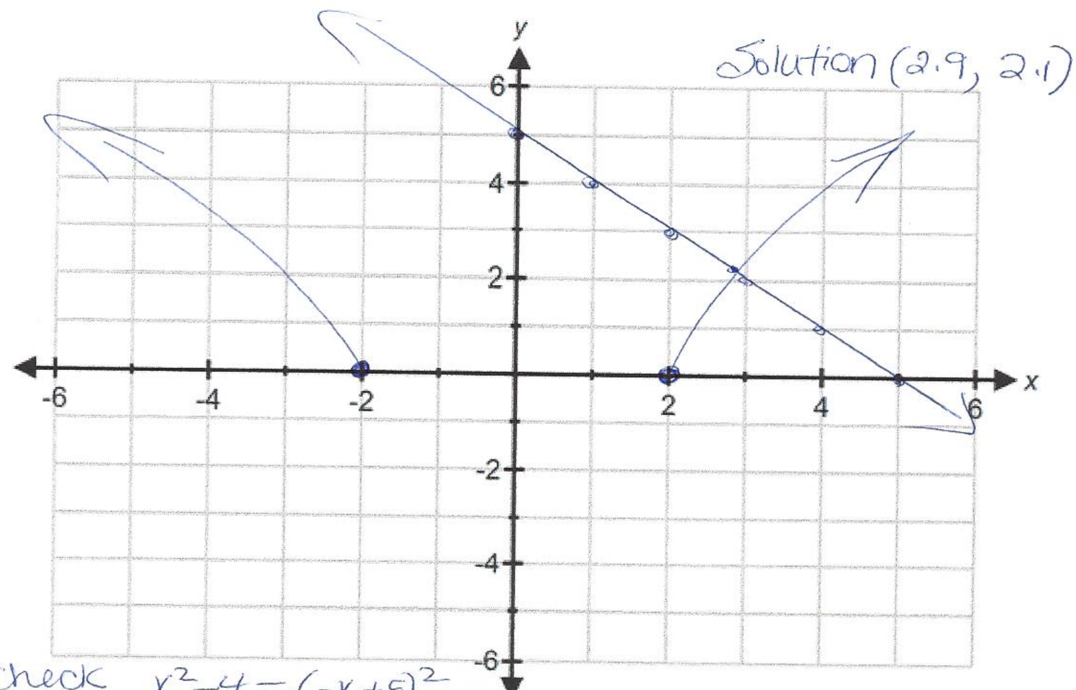
Solution $(3,4)$ $(-3,4)$

(B) $\sqrt{x^2-4} - 5 = -x$

Solution $(2.9, 2.1)$

$y = \sqrt{x^2-4}$

$y = -x + 5$



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

$v(0, -4)$

xint ± 2

Check $x^2 - 4 = (-x+5)^2$

$x^2 - 4 = x^2 - 10x + 25$

$10x = 29$

$x = 2.9$