Mathematics 3200
Test 3 (Radical Functions)

Part A : Place the letter in the blank at the right that corresponds to the correct answer to each of the following.

1. Which of the following functions transforms $y = \sqrt{x}$, 3 units to the right and 6 units up? 1. _____
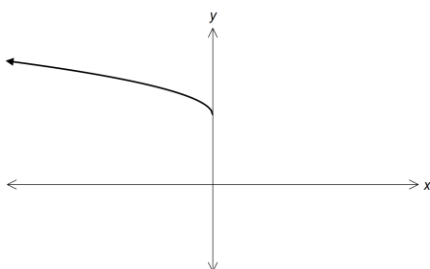
(A) $y = \sqrt{x-3} + 6$ (B) $y = \sqrt{x+3} + 6$

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

2. Which function best represents the graph below ? 2. _____

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

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

3. Which is true for the function $y = -2\sqrt{3x-6}$ when compared to $y = \sqrt{x}$? 3. _____

	Horizontal Stretch Factor	Vertical Stretch Factor
(A)	$-\frac{1}{2}$	3
(B)	$-\frac{1}{2}$	$\frac{1}{3}$
(C)	$\frac{1}{2}$	3
(D)	$\frac{1}{2}$	$\frac{1}{3}$

4. The point $(4, 2)$ is on the graph of $y = \sqrt{x}$, what is the image point under the transformation $y = 2\sqrt{4(x-1)} + 2$? 4. _____

(A) $(2, 6)$ (B) $(17, 6)$

(C) $(15, 2)$ (D) $(0, 6)$

5. What are the invariant points for the graph of $f(x) = x + 3$ and $y = \sqrt{f(x)}$?   5. ____

(A) $(-3,0)$, $(-2,1)$ (B) $(3,0)$, $(2,1)$

(C) $(0,-3)$, $(1,-2)$ (D) $(0,3)$, $(1,2)$

6. If $f(x) = x^2 - 16$, what is the domain of $y = \sqrt{f(x)}$?   6. ____

(A) $\{x / x \in R\}$ (B) $\{x / x \geq -16, x \in R\}$

(C) $\{x / -4 \leq x \leq 4, x \in R\}$ (D) $\{x / x \leq -4 \text{ or } x \geq 4, x \in R\}$

7. If $f(x) = 2x + 5$, which of the following is true for $y = \sqrt{f(x)}$?

     7. ____

	Domain	Range
(A)	$\{x / x \in R\}$	$\{y / y \in R\}$
(B)	$\{x / x \geq -\frac{5}{2}, x \in R\}$	$\{y / y \in R\}$
(C)	$\{x / x \geq -\frac{5}{2}, x \in R\}$	$\{y / y \geq 0, y \in R\}$
(D)	$\{x / x \geq 0, x \in R\}$	$\{y / y \geq -\frac{5}{2}, y \in R\}$

8. If $g(x) = \sqrt{5x - 10}$, what translation is performed on $f(x) = \sqrt{x}$ to get the graph of g(x)?   8. ____

(A) 10 units right   (B) 10 units left

(C) 2 units left   (D) 2 units right

9. What are all the invariant points for the graph of $f(x) = 4x^2 + 3x$ and $y = \sqrt{f(x)}$?   9. ____

(A) $(0,0), (1,7)$ (B) $\left(-\frac{3}{4}, 0\right), (0,0)$

(C) $\left(\frac{1}{4}, 1\right), (-1,1)$ (D) $(-1,1), \left(-\frac{3}{4}, 0\right), (0,0), \left(\frac{1}{4}, 1\right)$

10. The graph of the function $y = \sqrt{x}$ is stretched horizontally by a factor of 2 and translated   10. ____
    3 units left. What is the domain of the transformed function?
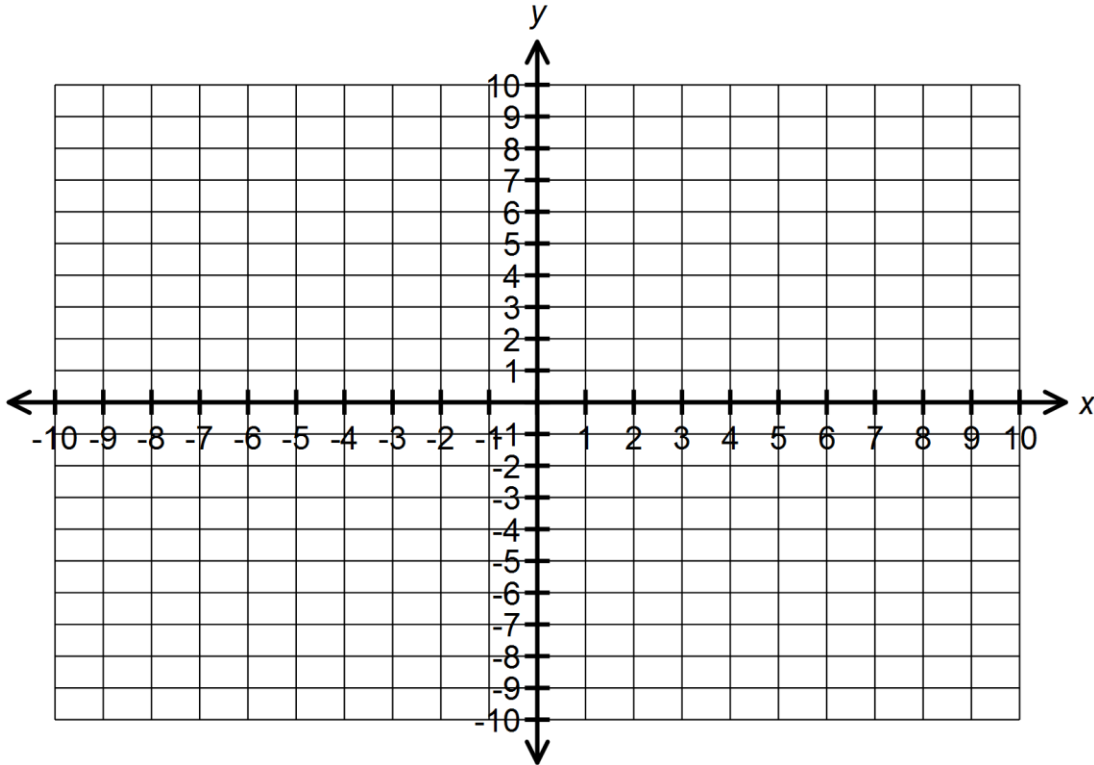
(A) $\{x / x \geq -3, x \in R\}$ (B) $\{x / x \geq -\frac{3}{2}, x \in R\}$

(C) $\{x / x \geq -1, x \in R\}$ (D) $\{x / x \geq \frac{3}{2}, x \in R\}$

Part B : Answer each question and show all workings.

1. If $f(x) = 2 - x$ sketch the graph of $f(x)$ and $y = \sqrt{f(x)}$ using a table of values. Label the invariant point(s).
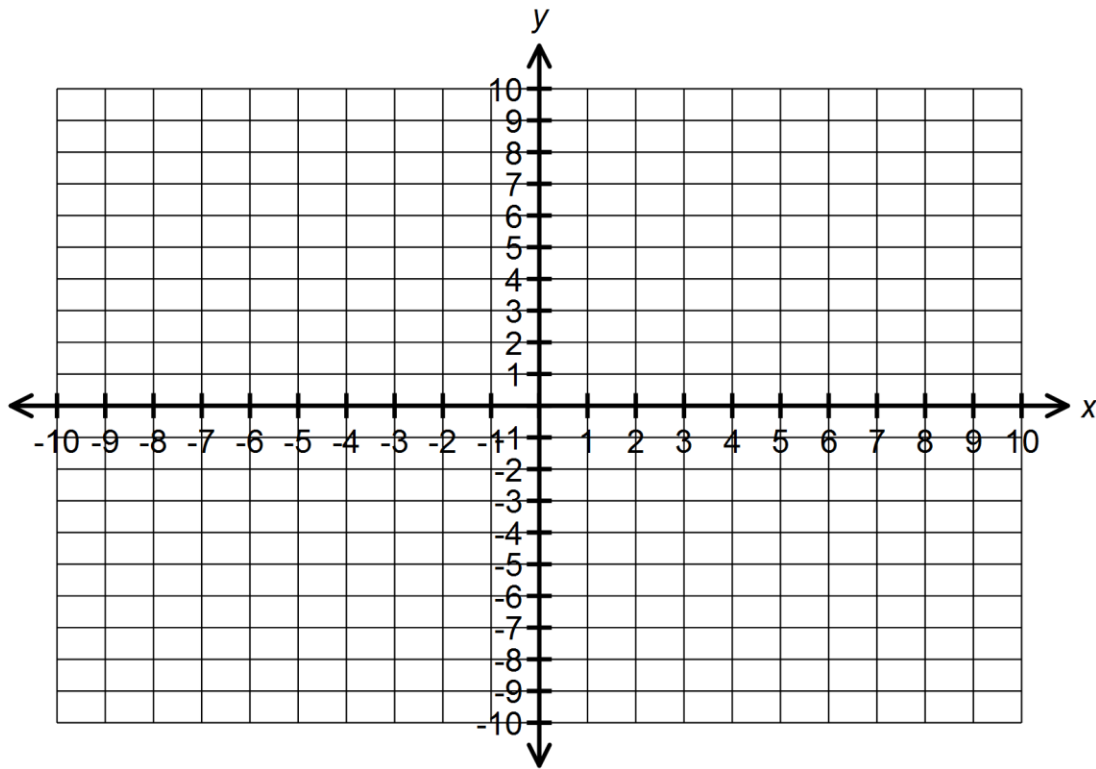
X	$y = f(x)$
2	
1	
-2	
-7	

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

2. If $f(x) = x^2 - 4$ sketch the graph of $f(x)$ and $y = \sqrt{f(x)}$ using a table of values. Label the invariant points.

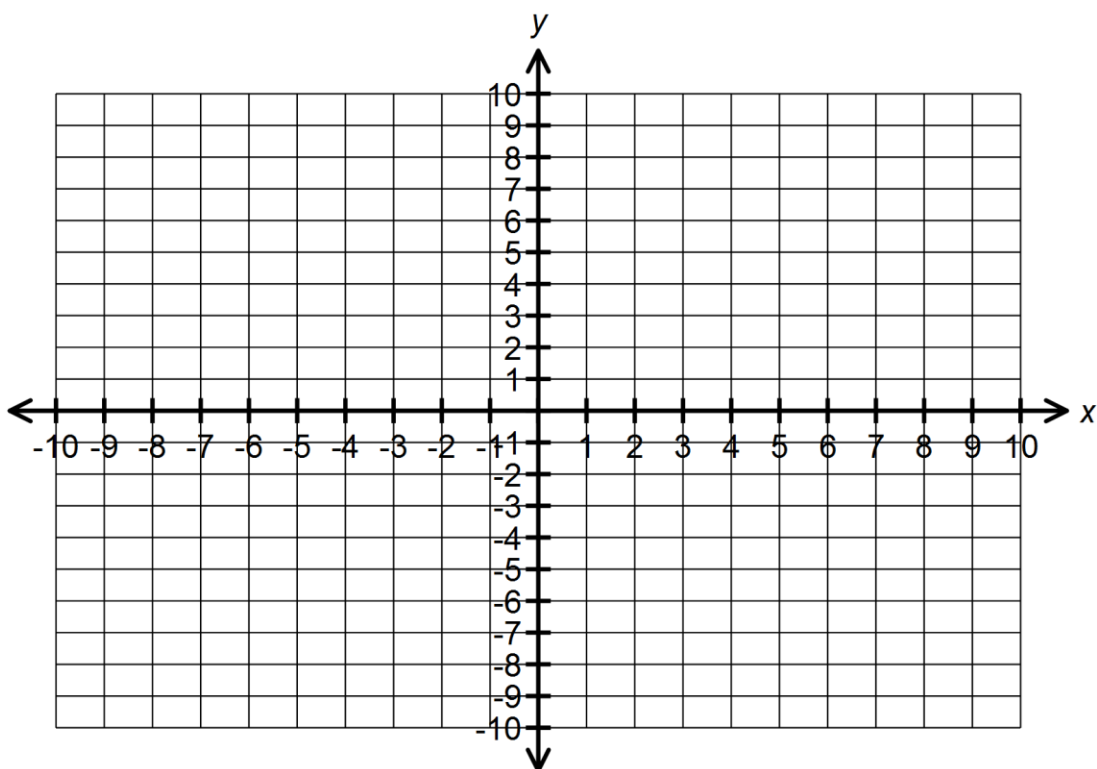| X	$f(x)$

X	$\sqrt{f(x)}$

3. Solve graphically $\sqrt{25 - x^2} = 4$

X	Y

X	Y

4. Solve $\sqrt{x+3} = x+1$

X	Y

X	Y