

NAME: _____

SECTION A: Selected Response: Circle the letter of your response

10 pts

- A function is defined as $f(x) = x^2 - 5$. What is the minimum value of the function $y = \sqrt{f(x)}$?

A -5 B 0 C 1 D 5
- The equation of a function is given as $f(x) = x^2 + 1$. What is the domain of $y = \sqrt{f(x)}$?

A $x \in (-\infty, \infty)$ B $x \in [1, \infty)$ C $x \in (1, \infty)$ D $x \in (-\infty, -1] \cup [1, \infty)$
- Which set of transformations would map $y = \sqrt{x}$ onto $y - 3 = -\sqrt{4(x + 2)}$?

A Reflection in the x-axis, horizontal stretch by a factor of 4, translation of 2 units right and 3 units down.

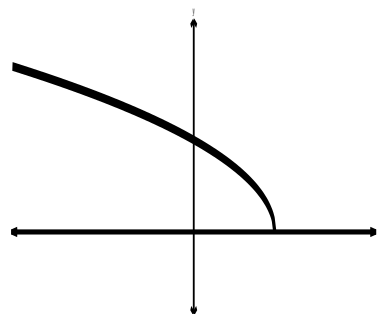
B Reflection in the x-axis, horizontal stretch by a factor of $\frac{1}{4}$, translation of 2 units left and 3 units up.

C Reflection in the y-axis, horizontal stretch by a factor of 4, translation of 2 units right and 3 units down.

D Reflection in the y-axis, horizontal stretch by a factor of $\frac{1}{4}$, translation of 2 units left and 3 units up.

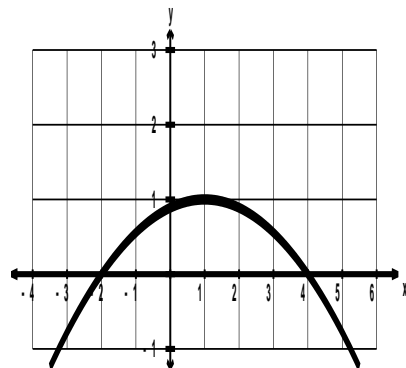
4. Which function best represents the graph shown below?

- A $y = \sqrt{-(x - 2)}$
 B $y = \sqrt{-x} - 2$
 C $y = -\sqrt{x - 2}$
 D $y = -\sqrt{x} - 2$



5. The graph of a function $y = f(x)$ is shown. Which statement about the function $y = \sqrt{f(x)}$ is true?

- A It has two invariant points and has range $y \leq 1$
 B It has three invariant points and has range $y \leq 1$
 C It has two invariant points and has range $y \in [0, 1]$
 D It has three invariant points and has range $y \in [0, 1]$



6. Which function has domain $\{x/x \geq -2, x \in R\}$ and $\{y/y \leq 3, y \in R\}$?

- A $y - 3 = -\sqrt{x + 2}$ B $y + 3 = -\sqrt{x - 2}$
 C $y - 3 = \sqrt{x - 2}$ D $y + 3 = \sqrt{x + 2}$

7. The function $y = f(x)$ contains the point (9, 4). Which point must lie on the graph of $y = \sqrt{f(x)}$?

- A (3, 2) B (9, 2) C (3, 4) D (2, 3)

8. The point $(n, -2)$ lies on the graph of the function $y = 2\sqrt{x - 1} - 6$. Which value is correct for n ?

- A 2 B 3 C 5 D 50

9. Which mapping rule would map $y = \sqrt{x}$ onto $-\frac{1}{3}(y + 2) = \sqrt{2x + 6}$?

A $(x, y) \rightarrow (\frac{1}{2}x - 6, -3y - 2)$

B $(x, y) \rightarrow (\frac{1}{2}x - 3, -3y - 2)$

C $(x, y) \rightarrow (2x - 6, -\frac{1}{3}y + 2)$

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

10. The graph of the function $y = \sqrt{x}$ is reflected in the x-axis and is translated 4 units left and 2 units up. Which describes the domain and range of the resulting function?

A Domain: $x \leq -4$ Range: $y \leq 2$

B Domain: $x \leq -4$ Range: $y \geq 2$

C Domain: $x \geq -4$ Range: $y \leq 2$

D Domain: $x \geq -4$ Range: $y \geq 2$

SECTION B: Constructed Response: Answer ALL questions in the space provided.

1. Determine all of the invariant points for the graph of $f(x) = x^2 - 4x + 3$ and $y = \sqrt{f(x)}$?

3 pts

2. For the radical function $y - 4 = \sqrt{-\frac{1}{3}x + 1}$

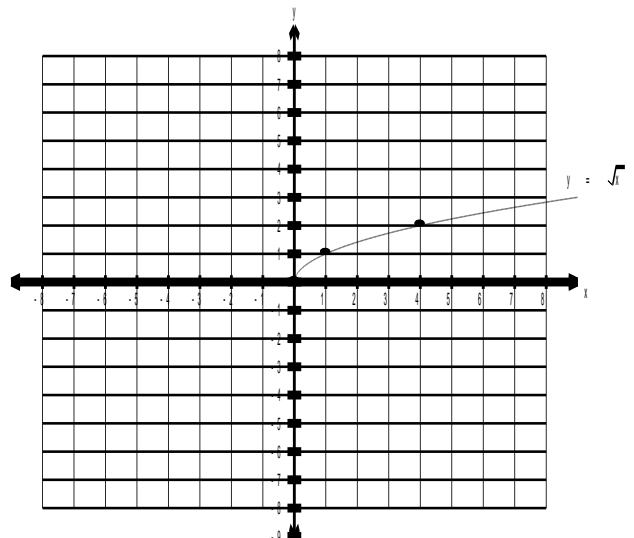
6 pts

(a) List the transformations required to map $y = \sqrt{x}$ onto the given function.

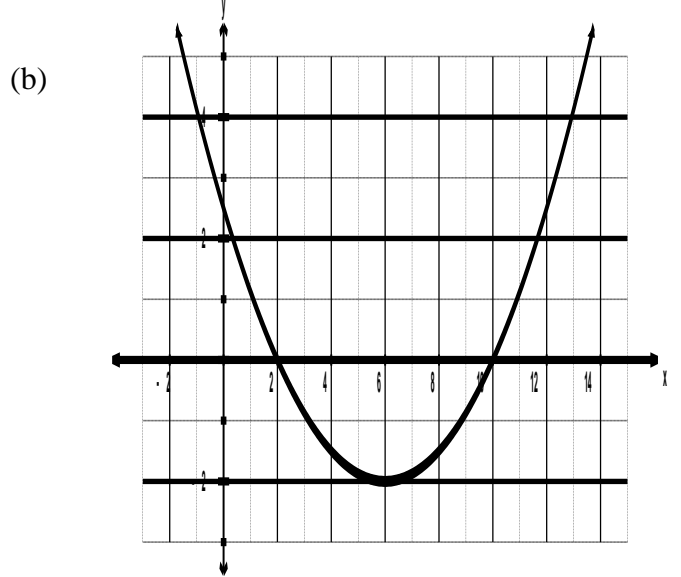
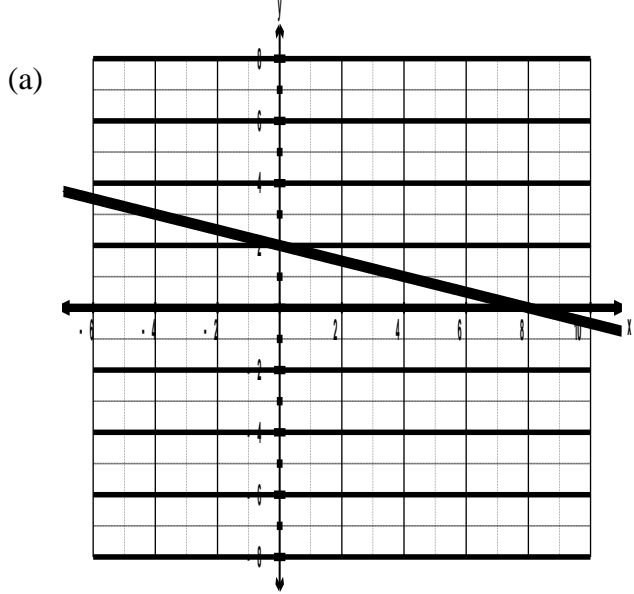
(b) Write the mapping rule that maps $y = \sqrt{x}$ onto the given function.

(c) State the domain and range of the function.

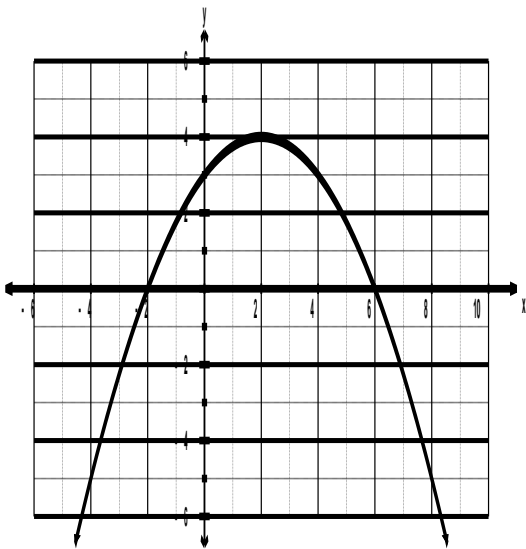
(d) Sketch the graph on the grid provided, showing the image points for those shown on the graph of $y = \sqrt{x}$



3. In each of the following, the graph of a function $y = f(x)$ is shown. On the same grid, sketch the graph of the function $y = \sqrt{f(x)}$, indicating all invariant points. **State the domain and range of $y = \sqrt{f(x)}$.** **9 pts**



(c)



4. If $f(x) = x^2 - 4x - 12$, determine the domain and range of $y = \sqrt{f(x)}$. Include algebraic workings. **4 pts**

5. Complete the table below. Ensure that you show algebraic workings.

8 pts

	$y = -\frac{1}{2}x^2 + 4x$	$y = \sqrt{-\frac{1}{2}x^2 + 4x}$
x-intercepts		
y-intercept		
Max. value		
Min. value		
Domain		
Range		
Invariant Points		

6. Solve each equation graphically:

6 pts

(a)

$$\sqrt{x^2 - 7} = 3$$

(b)

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

