
Complete the following problems. Show all work to receive full credit.

1. Consider the function $y = \sqrt{2 - \sqrt{x}}$. What is the domain of the function?

We need

$$\begin{aligned}2 - \sqrt{x} &\geq 0 \\2 &\geq \sqrt{x} \\x &\leq 4\end{aligned}$$

We also need for $x \geq 0$ for \sqrt{x} to be defined. Therefore the domain of the function is

$$0 \leq x \leq 4$$

2. Consider the function $y = \sqrt{-x}$.

- (a) Is the function even? Explain.

If a function is even, $f(-x) = f(x)$. In this case, $f(-x) = \sqrt{x} \neq \sqrt{-x}$ since the domains are different. Therefore, the function is not even.

- (b) Is the function odd? Explain.

If a function is even, $f(-x) = -f(x)$. In this case, $f(-x) = \sqrt{x} \neq -\sqrt{-x}$. Therefore it is not odd.

- (c) Specify the intervals on which the function is increasing. Show all work.

$y = \sqrt{-x}$ is always decreasing, and is defined for $x \leq 0$, so it is decreasing on the interval $(-\infty, 0]$. It is never increasing.

3. Write the equation for the function which is the function $y = \frac{1}{2}(x + 1) + 5$ shifted down 5 and right 1.

$$\begin{aligned}y &= \frac{1}{2}x + \frac{1}{2} + 5 \\&= \frac{1}{2}x + \frac{11}{2}\end{aligned}$$

So the shifted graph is:

$$\begin{aligned}y &= \frac{1}{2}(x - 1) + \frac{11}{2} - 5 \\&= \frac{1}{2}x - \frac{1}{2} + \frac{1}{2} \\&= \frac{1}{2}x\end{aligned}$$