Extra Practice: Function Notation

a) Given: $f(x) = \sqrt{x+1}$

    i)   Write the image equation for the transformation: $y = f(x-2) + 4$

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

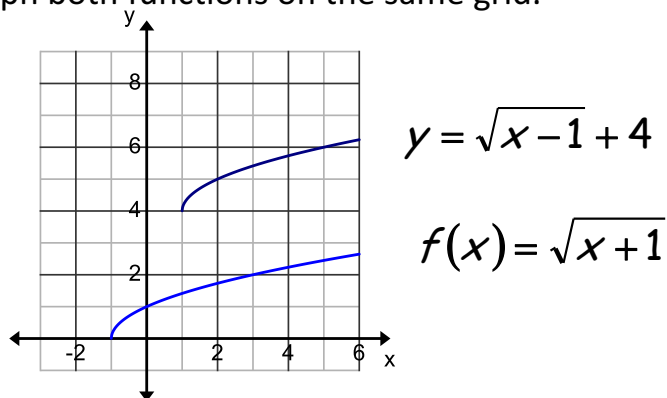   ii)   State the domain and range of each function.

$f(x) = \sqrt{x+1}$	$D = \{x \in R \mid x \geq -1\}$	$R = \{y \in R \mid y \geq 0\}$
$y = \sqrt{x-1} + 4$	$D = \{x \in R \mid x \geq 1\}$	$R = \{y \in R \mid y \geq 4\}$

    iii)   Graph both functions on the same grid.

$$y = \sqrt{x-1} + 4$$

$$f(x) = \sqrt{x+1}$$

b) Given: $f(x) = \sqrt{x} - 1$

    i)   Write the image equation for the transformation: $y = f(x-3) + 2$

$$y = \sqrt{(x-3)} - 1 + 2$$
$$y = \sqrt{x-3} + 1$$

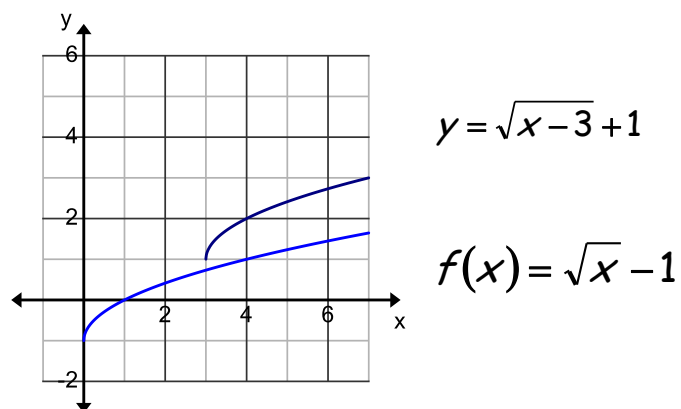   ii)   State the domain and range of each function.

$f(x) = \sqrt{x} - 1$	$D = \{x \in R \mid x \geq 0\}$	$R = \{y \in R \mid y \geq -1\}$
$y = \sqrt{x-3} + 1$	$D = \{x \in R \mid x \geq 3\}$	$R = \{y \in R \mid y \geq 1\}$

    iii)   Graph both functions on the same grid.

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

$$f(x) = \sqrt{x} - 1$$

c) Given: $f(x) = \dfrac{1}{x+1}$

    i)   Write the image equation for the transformation: $y = f(x+1)$

$$y = \frac{1}{(x+1)+1}$$

$$y = \frac{1}{x+2}$$

    ii)   State the domain and range of each function.

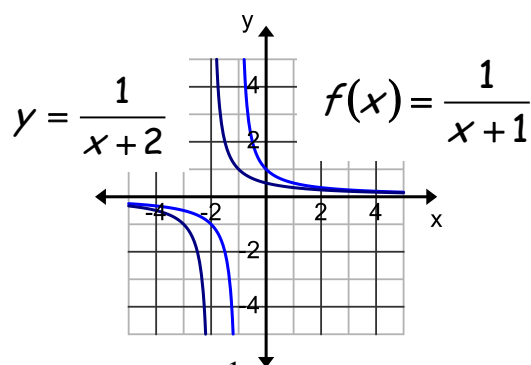$f(x) = \dfrac{1}{x+1}$ $D = \{x \in R \mid x \neq -1\}$ $R = \{y \in R \mid y \neq 0\}$

$y = \dfrac{1}{x+2}$ $D = \{x \in R \mid x \neq -2\}$ $R = \{y \in R \mid y \neq 0\}$

Graph both functions on the same grid.

$$y = \frac{1}{x+2} \qquad f(x) = \frac{1}{x+1}$$

d) Given: $f(x) = \dfrac{1}{x} + 2$

    i)   Write the image equation for the transformation: $y = f(x-3) + 4$

$$y = \frac{1}{(x-3)} + 2 + 4$$

$$y = \frac{1}{x-3} + 6$$

    ii)   State the domain and range of each function.

$f(x) = \dfrac{1}{x} + 2$ $D = \{x \in R \mid x \neq 0\}$ $R = \{y \in R \mid y \neq 2\}$

$y = \dfrac{1}{x-3} + 6$ $D = \{x \in R \mid x \neq 3\}$ $R = \{y \in R \mid y \neq 6\}$

Graph both functions on the same grid.

$$y = \frac{1}{x-3} + 6$$

$$f(x) = \frac{1}{x} + 2$$