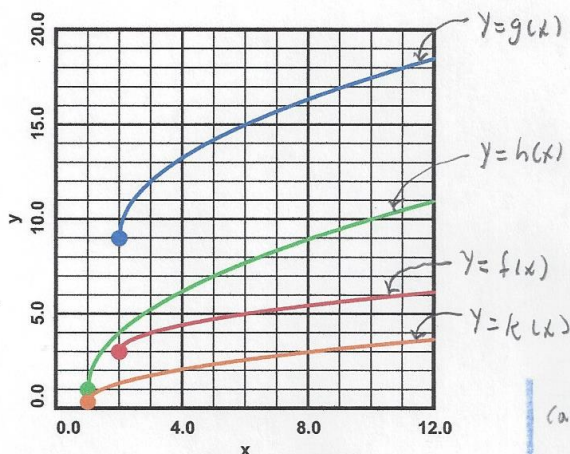


PRE-AP ALGEBRA 2

3C.2 CLASSWORK

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

- Graph  $y = f(x)$  on the axes below.
- Construct a function  $y = g(x)$  which is a vertical stretch, by a factor of 3, of  $y = f(x)$ .
- Graph  $y = g(x)$ .
- Construct a function  $y = h(x)$  which is a translation, by  $(-1, -8)$ , of  $y = g(x)$ .
- Graph  $y = h(x)$ .



(b)  $y = g(x) = 3f(x) = 3\sqrt{x-2} + 9$

(d)  $y = h(x) = g(x+1) - 8 = 3\sqrt{x+1-2} + 9 - 8 = 3\sqrt{x-1} + 1$

2) In problem 1, the transformation from  $y = f(x)$  to  $y = h(x)$  is equivalent to:

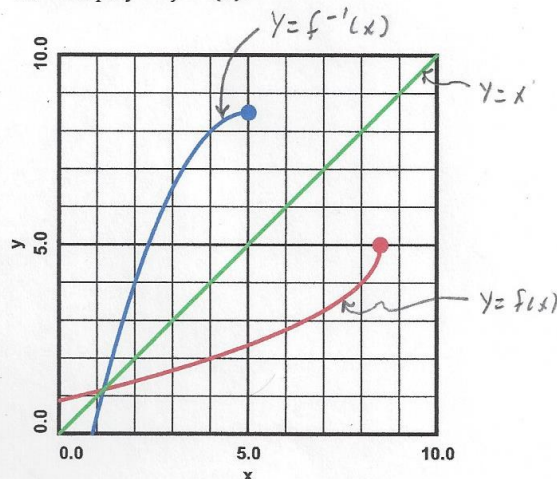
- Construct a function  $y = k(x)$  which is a translation, by  $(-1, -2\frac{2}{3})$ , of  $y = f(x)$ .
- Graph  $y = k(x)$  on the grid in problem 1.
- Construct  $y = h(x)$  as a vertical stretch, by a factor of 3, of  $y = k(x)$ .

(a)  $y = k(x) = f(x+1) - 2\frac{2}{3} = \sqrt{x+1-2} + 3 - 2\frac{2}{3} = \sqrt{x-1} + \frac{1}{3}$

(c)  $y = h(x) = 3k(x) = 3\sqrt{x-1} + 1$

3) Let  $y = f(x) = 5 - \sqrt{17-2x}$ .

- State the domain and range of  $y = f(x)$ .
- Graph  $y = f(x)$  and  $y = x$  on the axes below.
- Calculate  $y = f^{-1}(x)$ . Remember to state the domain restriction.
- Graph  $y = f^{-1}(x)$ .



(a)  $17-2x=0, 2x=17, x=\frac{17}{2}=8.5$

x	f(x)
8	4
8.5	5 ← vertex
9	undef.

$f(x)$  (8.5, 5)  
(8, 4)

domain:  $-\infty < x \leq 8.5$

range:  $-\infty < y \leq 5$

(c)  $x = 5 - \sqrt{17-2y}, -\sqrt{17-2y} = x-5$

$17-2y = (x-5)^2 = x^2 - 10x + 25$

$-2y = x^2 - 10x + 8$

$y = f^{-1}(x) = -\frac{1}{2}x^2 + 5x - 4 \quad (-\infty < x \leq 5)$