

Honors Algebra 2

Chapter 7: Mid-Chapter Review

Name: Key  
 Period: \_\_\_\_\_ Date: \_\_\_\_\_

Use these four functions to find what's requested in #1 - #8. Be sure to state any relevant domain restriction.

$f(x) = x^2 - 2x + 1$        $g(x) = x^2$        $h(x) = x + 3$        $k(x) = 2x - 5$

1)  $2x^2 - 2x + 1$   $(g + f)(x)$

2)  $x^2 - 3x - 2$   $(f - h)(x)$

3)  $\frac{x^2 - 2x + 1}{2x - 5}$ ,  $x \neq \frac{5}{2}$   
 $\frac{f(x)}{k(x)}$

4)  $x^3 + 3x^2$   $(g * h)(x)$

5) 4  $g(h(-5))$

6)  $x^2 + 4x + 4$   $[f \circ h](x)$

7) 1 What number(s) would not be in the domain of  $\frac{h(x)}{f(x)}$ ?

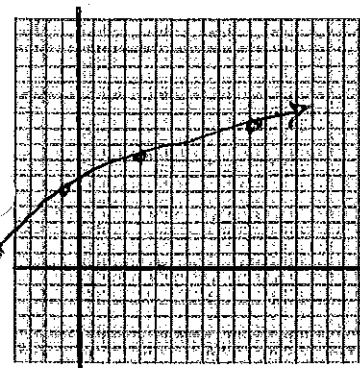
8)  $\frac{x+5}{2}$   $k^{-1}(x)$

9) Given  $f(x) = 2\sqrt{x+5} + 1$ :

9a)  $\{x \mid x \geq -5\}$  State the domain of  $f(x)$ .

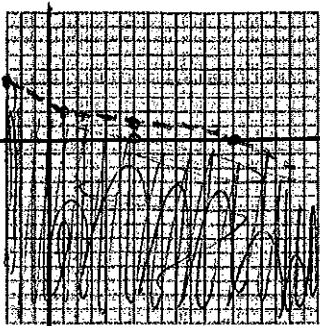
9b)  $\{f(x) \mid f(x) \geq 1\}$  State the range of  $f(x)$ .

9d) Make a table of values & graph  $f(x)$ .



| x  | y |
|----|---|
| -5 | 1 |
| -1 | 5 |
| 4  | 7 |
| 11 | 9 |

10) Graph  $y < -\sqrt{x+3} + 4$



| x  | y |
|----|---|
| -3 | 4 |
| -1 | 2 |
| 6  | 1 |
| 13 | 0 |

11) yes Use composition to determine if  $f(x) = 4x^2$  &  $g(x) = \frac{1}{2}\sqrt{x}$  are inverse functions. Write YES or NO & explain how this is determined.

$$f(g(x)) = 4\left(\frac{1}{2}\sqrt{x}\right)^2 = 4\left(\frac{1}{4}x\right) = x$$

$$g(f(x)) = \frac{1}{2}\sqrt{4x^2} = \frac{1}{2}(2x) = x$$

Since  $f(g(x)) = g(f(x)) = x$ , the identity, we know  $f(x)$  &  $g(x)$  are inverses

12) sometimes Is composition always, sometimes, or never commutative? Give a thorough justification for your answer. In general, composition is NOT commutative. For

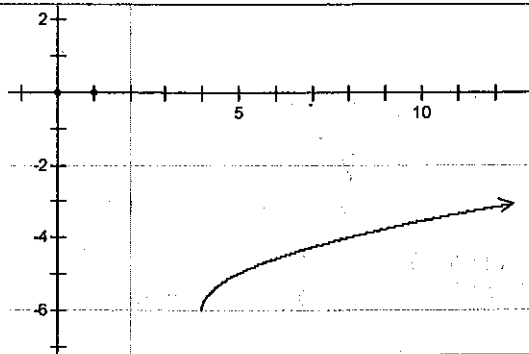
example  $f(x) = 2x$  &  $g(x) = x+2$ ;  $(f \circ g)(x) = 2x+4$  while  $(g \circ f)(x) = 2x+2$ . Results are not the same. However, if you compose functions that are inverses of each other you get  $x$  both ways...

$$[f^{-1}(x) \circ f(x)] = [f(x) \circ f^{-1}(x)] = x$$

13)  $-\sqrt{x-8} + 14$  Write a square root function for which the domain is  $\{x/x \geq 8\}$  & the range is  $\{y/y \leq 14\}$ .

14)  $f(x) = \sqrt{x-4} - 6$

Write the square root function represented by this graph ----->



15) NO Are  $f(x)$  &  $g(x)$  inverse functions? Explain how this can be determined by just looking at this graph  $\rightarrow$   $f(x)$  &  $g(x)$  are not reflections of each other across  $y=x$  as is the case with the graphs of any 2 inverse functions

