Answer Key

No work

Unit 2 (2.6) Compositions and Inverses – Practice

$a(x) = \frac{x}{5} - 3$ $b(x) = 3x - 1$ $c(x) = \sqrt{2x+5}$ $d(x) = \frac{x^2-5}{9}$

$e(x) = \frac{x+8}{2}$ $f(x) = \sqrt{\frac{x+1}{2}} - 3$ $g(x) = \frac{4}{5}x - 20$ $h(x) = 4(x-2)^2 + 5$

Find:

1. $a^{-1}(x)$

$a^{-1}(x) = 5x + 15$

2. $b^{-1}(x)$

$b^{-1}(x) = \frac{x+1}{3}$

or $\frac{1}{3}x + \frac{1}{3}$

3. $c^{-1}(x)$

$c^{-1}(x) = \frac{x^2-5}{2}$

or $\frac{1}{2}x^2 - \frac{5}{2}$

4. $d^{-1}(x)$

$d^{-1}(x) = \sqrt{9x+5}$

5. $e^{-1}(x)$

$e^{-1}(x) = 2x - 8$

6. $f^{-1}(x)$

$f^{-1}(x) = 2(x+3)^2 - 1$

or $2x^2 + 12x + 17$

$a(x) = \frac{x}{5} - 3$ $\quad b(x) = 3x - 1$ $\quad c(x) = \sqrt{2x+5}$ $\quad d(x) = \frac{x^2-5}{9}$

$e(x) = \frac{x+8}{2}$ $\quad f(x) = \sqrt{\frac{x+1}{2}} - 3$ $\quad g(x) = \frac{4}{5}x - 20$ $\quad h(x) = 4(x-2)^2 + 5$

7. $g^{-1}(x)$

$g^{-1}(x) = \frac{5}{4}x + 25$

8. $h^{-1}(x)$

$h^{-1}(x) = \sqrt{\frac{x-5}{4}} + 2$

9. $h(f(1))$

69

10. $g(e(-18))$

-24

11. $d(a(30))$

$\frac{4}{9}$

12. $b(c(22))$

20

$f(x) = 4x - x^2$ $g(x) = -3x^2$ $h(x) = 2 - x$

13. $f(g(x))$

$-12x^2 - 9x^4$

or

$-9x^4 - 12x^2$

14. $h(f(x))$

$x^2 - 4x + 2$

15. $h(h(x))$

X

Prove the following are inverses by using compositions.

16. $v(x) = \frac{2}{3}x - 6$ *and* $w(x) = \frac{3}{2}x + 9$

X X

17. $j(x) = 7(x-1)^2$ *and* $k(x) = \sqrt{\frac{x}{7}} + 1$

X X

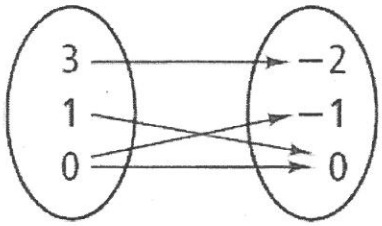
18. $f(x) = 2x^2 - 3$ *and* $g(x) = \sqrt{\frac{x+3}{2}}$

X X

19. $a(x) = 2\sqrt{x-7} + 4$ *and* $b(x) = \left(\frac{x-4}{2}\right)^2 + 7$

X X

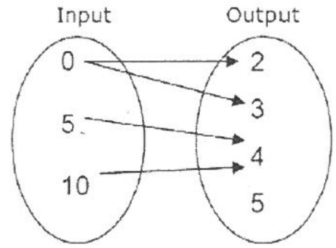
20. Function: YES NO



Domain: { 3, 1, 0 }

Range: { −2, −1, 0 }

21. Function: YES NO



Domain: { 0, 5, 10 }

Range: { 2, 3, 4 }

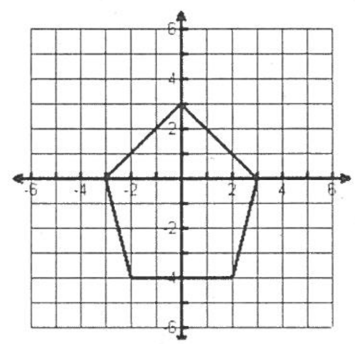
22. Function: YES NO

x	y
0	2
3	1
3	−1
5	3

Domain: { 0, 3, 5 }

Range: { 2, 1, −1, 3 }

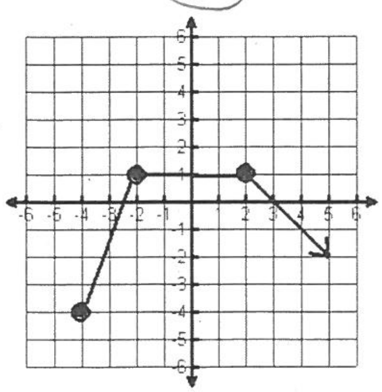
23. Function: YES NO



Domain: [−3, 3]

Range: [−4, 3]

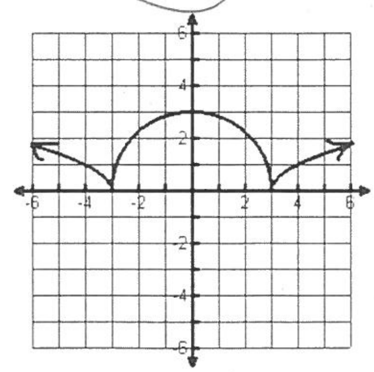
24. Function: YES NO



Domain: [−4, ∞)

Range: [−∞, 1]

25. Function: YES NO



Domain: (−∞, ∞)

Range: [0, ∞)