

Algebra 2 Assignment 41

NEW

BOOK: p532

7. $\{(3,2), (4,2)\}$

Inv: $\{(2,3), (2,4)\}$
not a function

15. $\{(2,4), (-3,1), (2,8)\}$

Inv: $\{(4,2), (1,-3), (8,2)\}$ Function

17. $\{(1,3), (1,-1), (1,3), (1,1)\}$

Inv: $\{(3,1), (-1,1), (-3,1), (1,1)\}$ Function

31. $f(x) = x+7$

$f(g(x)) = (x-7)+7 = x$

$g(x) = x-7$

$g(f(x)) = (x+7)-7 = x$

yes, inverses

33. $f(x) = \frac{x-2}{3}$

$f(g(x)) = \frac{(3x-2)-2}{3} = \frac{3x-4}{3}$

$g(x) = 3x-2$

Not inverses

Packet:

Determine if the function is one-to-one:

1. $f(x) = 3 - \frac{1}{2}x$ yes

2. $g(x) = \frac{x^2}{x^2+1}$ no

3. $h(x) = \frac{4-x}{6}$ yes

4. $h(x) = |x+4| - |x-4|$ no

5. $f(x) = -2x\sqrt{16-x^2}$ no

Determine if the function is One-to-one. If so, find its inverse:

6. $f(x) = 2x-3$

$y = 2x-3$

$x = \frac{y+3}{2}$

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

7. $f(x) = x^5$

$y = x^5 \rightarrow x = y^{\frac{1}{5}} \rightarrow \sqrt[5]{x} = \sqrt[5]{y^5}$

yes: $f^{-1}(x) = \sqrt[5]{x}$

8. $f(x) = \sqrt{x}$ $y = \sqrt{x} \rightarrow x = \sqrt{y}^2 \rightarrow y = x^2$ yes, $f^{-1}(x) = x^2$

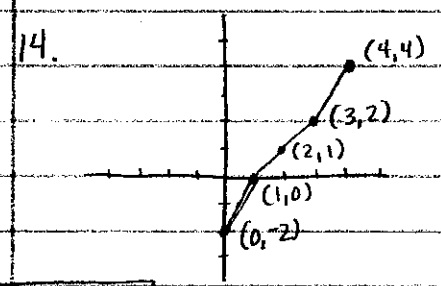
9. $g(x) = x^4$ not one-to-one - no inverse

10. $h(x) = \sqrt[3]{x-1}$ $y = \sqrt[3]{x-1} \rightarrow x = \sqrt[3]{y-1}^3 \rightarrow x^3 = y-1 \rightarrow y = x^3+1$
 $h^{-1}(x) = x^3+1$

11. $f(x) = \frac{x}{8} \rightarrow y = \frac{x}{8} \rightarrow x = \frac{y}{8} \rightarrow y = 8x$ $f^{-1}(x) = 8x$

12. $g(x) = x^2 - x^4$ not one-to-one - no inverse

13. $h(x) = \sqrt{2x+3}$ $y = \sqrt{2x+3} \rightarrow x^2 = \sqrt{2y+3} \rightarrow x^2 = 2y+3$
 $\rightarrow x^2 - 3 = 2y \rightarrow \frac{x^2-3}{2} = y$ $h^{-1}(x) = \frac{x^2-3}{2}$



REVIEW

15. (8, -2) perpendicular to $\frac{5x-7}{3} = \frac{3y}{3} \rightarrow \frac{5}{3}x - \frac{7}{3} = y$
 $m = -\frac{3}{5}$

$-2 = -\frac{3}{5}(8) + b \rightarrow -\frac{10}{5} = -\frac{24}{5} + b \rightarrow \frac{14}{5} = b$ $y = -\frac{3}{5}x + \frac{14}{5}$

No. $(x+y) = 11^3 \rightarrow 3x+3y = 3$
 $x-3y = 9 \rightarrow x-3y = 9$
 $4x = 12$
 $x = 3$

$\begin{matrix} 3+y=1 \\ -3 \quad 0-3 \end{matrix}$
 $y = -2$

(3, -2)

17. $\frac{(x+1)(x-1)}{2x^2-x-1} \div \frac{(x+2)(x-2)}{2x^2-3x-2} = \frac{(x+1)}{(2x+1)} \cdot \frac{(2x+1)}{(x+2)} = \frac{x+1}{x+2}$

Asmt 41 - continued

$$8. \frac{3(a-3) + 2(a-2)}{(a-2)(a-3)(a-3)(a-2)} = \frac{3a-9+2a-4}{(a-3)(a-2)} = \frac{5a-13}{(a-3)(a-2)}$$

$$19. \frac{(x-2)(x-6)}{x(x-6)} = \frac{(x-4)x}{(x-6)x} \rightarrow \frac{x^2-8x+12}{-x^2+4x} = \frac{x^2-4x}{-x^2+4x}$$

$$-4x+12=0 \rightarrow -4(x-3)=0$$

$$x-3=0 \rightarrow \boxed{x=3}$$

$$20. \frac{x(x-3)}{(x+1)(x-3)} + \frac{3(x+1)}{(x-3)(x+1)} + \frac{1(x-3)(x+1)}{(x-3)(x+1)} = 0$$

$$x^2-3x+3x+3+x^2-2x-3=0 \rightarrow 2x^2-2x=0 \rightarrow 2x(x-1)=0$$

$$2x=0, x-1=0 \quad \boxed{x=0, 1}$$

$$21. f(x) = 3-2x$$

$$g(x) = 3x^2+2$$

$$(f+g)(x) = 3-2x+3x^2+2 = \boxed{3x^2-2x+5}$$

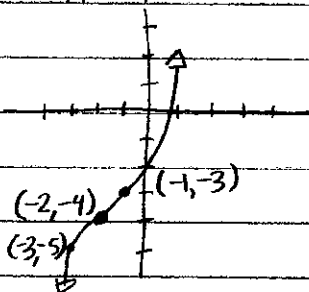
$$(f-g)(x) = 3-2x-3x^2-2 = \boxed{-3x^2-2x+1}$$

$$(fg)(x) = (3-2x)(3x^2+2) = 9x^2+6-6x^3-4x = \boxed{-6x^3+9x^2-4x+6}$$

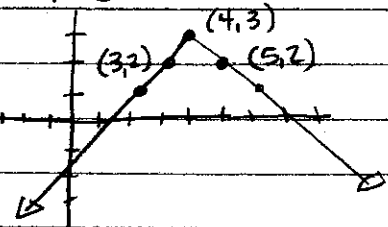
$$\left(\frac{f}{g}\right)(x) = \frac{3-2x}{3x^2+2}$$

$$22. y = |x-3| + 2 \quad \boxed{\text{moves 3 to the right, and up 2}}$$

$$23. y = (x+2)^3 - 4$$



$$24. y = -|x-4| + 3$$



$$25. \boxed{y = |x-2| - 4}$$

$$26. \boxed{y = \sqrt{x-1}}$$

27. $h(x) = 3x + 4$

Domain: \mathbb{R} , Range: \mathbb{R}

28. $f(x) = |x+2| - 4$

Domain: \mathbb{R} , Range: $y \geq -4$

Book: P 69

22. function

24. not a function

Page 523

4. $f(x) = x^2$ $h(x) = x+2$ $(f \circ h)(4) = ((4)+2)^2 = 6^2 = 36$

24. $f(x) = 7x - 5$

$(f \circ g)(3) = 7(3^2 - 3(3) + 7) - 5 = 7(7) - 5 = 44$

$g(x) = x^2 - 3x + 7$

$(g \circ f)(3) = (7(3) - 5)^2 - 3(7(3) - 5) + 7 = 16^2 - 3(16) + 7 = 256 - 48 + 7 = 215$

28. $g(x) = -2x$

$g(h(x)) = -2(-3x+1) = 6x-2$

$h(x) = -3x+1$

$h(g(x)) = -3(-2x)+1 = 6x+1$

Page 372

6. $f(x) = -2(x+3)^2$

vertex: $(-3, 0)$ opens down

8. $f(x) = x^2 - 4x + 5$

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

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

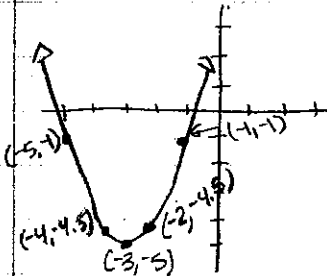
vertex: $(2, 1)$, opens up

32. $y = a(x+3)^2 + 6$

at $(-1, 2)$ $2 = a(-1+3)^2 + 6 \rightarrow -4 = 4a \rightarrow a = -1$

$y = -1(x+3)^2 + 6$

42. $f(x) = \frac{1}{2}(x+3)^2 - 5$



44. $f(x) = x^2 + 6x + 2$

$h = \frac{-6}{2} = -3$

$K = (-3)^2 + 6(-3) + 2 = 9 - 18 + 2 = -7$

