

Algebra 2 ~ Assignment 40

NEW

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9. $f(x) = -3x^2 + 12x$

$h = \frac{-12}{-6} = 2$ $K = 3(2)^2 + 12(2) = -12 + 24 = 12$

$f(x) = -3(x-2)^2 + 12$
vertex: (2, 12)
opens down

11. $y = -\frac{1}{2}(x+2)^2 - 3$

21. $f(x) = 3(x - \frac{1}{2})^2 + \frac{1}{4}$ vertex: $(\frac{1}{2}, \frac{1}{4})$ opens up

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

$h = \frac{-b}{2a} = \frac{4}{-2} = -2$ $K = -(2)^2 - 4(2) + 8 = -4 + 8 + 8 = 12$

$f(x) = -(x+2)^2 + 12$
vertex: (-2, 12)
opens down

25. $f(x) = -6x^2 + 24x$

$h = \frac{-24}{-12} = 2$ $K = -6(2)^2 + 24(2) = -24 + 48 = 24$

$f(x) = -6(x-2)^2 + 24$
vertex: (2, 24)
opens down

27. $f(x) = -2x^2 - 20x - 50$

$h = \frac{-20}{2(-2)} = \frac{-20}{-4} = 5$ $K = -2(25) - 20(-5) - 50 = -50 + 100 - 50 = 0$

$f(x) = -2(x+5)^2$
vertex: (-5, 0)
opens down

31. $y = a(x-4)^2 + 1$

at (2, -2) $-2 = a(2-4)^2 + 1 \rightarrow -3 = a(-2)^2 \rightarrow -3 = a \cdot 4 \rightarrow a = -\frac{3}{4}$

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

33. $y = a(x-0)^2 + 5$

at (3, 8) $8 = a(3)^2 + 5 \rightarrow 3 = a \cdot 9 \rightarrow a = \frac{3}{9} = \frac{1}{3}$

$y = \frac{1}{3}(x)^2 + 5$

35. $y = a(x-5)^2 + 4$

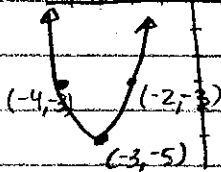
at (3, -8) $-8 = a(3-5)^2 + 4 \rightarrow -12 = a(4) \rightarrow a = -3$

$y = -3(x-5)^2 + 4$

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P. 2

44. $f(x) = 2(x+3)^2 - 5$

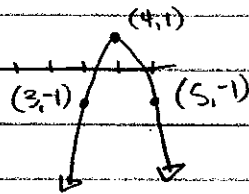
vertex $(-3, -5)$



45. $f(x) = -2x^2 + 16x - 31$

$h = \frac{-16}{-4} = 4$ vertex $(4, 1)$

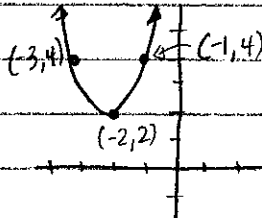
$k = -2(16) + 16(4) - 31$
 $= -32 + 64 - 31$
 $= 64 - 63 = 1$



47. $f(x) = 2x^2 + 8x + 10$

$h = \frac{-8}{4} = -2$ vertex $(-2, 2)$

$k = 2(-2)^2 + 8(-2) + 10$
 $= 8 - 16 + 10$
 $= -8 + 10 = 2$



REVIEW

1. $|2x-6| = -3$ No Solution

2. $\left(\frac{2xy^2}{a^4}\right)^{-3} = \left(\frac{a^4}{2xy^2}\right)^3 = \frac{a^{12}}{8x^3y^6}$

3. Factor: $63xy^2 - 7x^3$
 $= 7x(9y^2 - x^2) = \boxed{7x(3y+x)(3y-x)}$

4. $\frac{x^2-4}{4x^2-1} \times \frac{2x-1}{x+2} = \frac{(x+2)(x-2)}{(2x+1)(2x-1)} \cdot \frac{(2x-1)}{(x+2)} = \frac{x-2}{2x-1}$

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

6. $\frac{(x-4)^{(x-4)}}{(x+4)(x-2)(x+4)(x+1)(x-4)(x-2)} = \frac{x^2-8x+16 - (x^2-4)}{(x+4)(x-4)(x-2)} = \frac{-8x+20}{(x+4)(x-4)(x-2)}$

Asmt 40 - continued

7. $x^3 + 1 \stackrel{(x-3)}{=} \frac{(3)(x-3)}{3(x-3)} \rightarrow 3x + x - 3 = 3x - 9$
 $\frac{x^3 + 1}{(x-3)^3} = \frac{(3)(x-3)}{3(x-3)}$
 $4x - 3 = 3x - 9$
 $x = -6$

8. $\frac{3y^7 - 5 \stackrel{(2+y)}{}}{(2+y)^7} = \frac{4(7)(2+y)}{7(2+y)} \rightarrow 21y - 10 - 5y = 56 + 28y$
 $\frac{3y^7 - 5}{(2+y)^7} = \frac{4(7)(2+y)}{7(2+y)}$
 $16y - 10 = 56 + 28y$
 $-66 = 12y \rightarrow y = \frac{-66}{12} = \frac{-11}{2}$

9. $\frac{(3m+2)^2 + (2m-1)^5}{(5m)^2} = \frac{4(10m)}{10m} \rightarrow 6m + 4 + 10m - 5 = 40m$
 $\frac{(3m+2)^2 + (2m-1)^5}{(5m)^2} = \frac{4(10m)}{10m}$
 $16m - 1 = 40m$
 $-1 = 24m \rightarrow m = \frac{-1}{24}$

10. $\frac{12}{x^2-16} - \frac{24 \stackrel{(x+4)}{}}{(x-4)(x+4)} = \frac{3(x^2-16)}{(x^2-16)} \rightarrow 12 - 24x - 96 = 3x^2 - 48$
 $\frac{12}{(x+4)(x-4)} - \frac{24(x+4)}{(x-4)(x+4)} = \frac{3(x^2-16)}{(x^2-16)}$
 $0 = 3x^2 + 24x + 36$
 $0 = 3(x^2 + 8x + 12)$
 $0 = 3(x+6)(x+2) \rightarrow x = -6, -2$

11. $x^2 + y^2 - 2x - 4y + 1$ Not a function, exponents on y.

12. $x^2 - xy + 3 = 0$ Not a function, variables being multiplied.

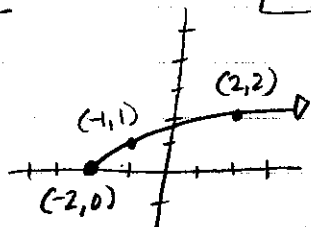
13. $f(x) = 3x + 1$ $(f+g)(x) = 3x + 1 + x^2 + 2x - 1 = x^2 + 5x$
 $g(x) = x^2 + 2x - 1$ $(f-g)(x) = 3x + 1 - x^2 - 2x + 1 = -x^2 + x + 2$
 $(fg)(x) = (3x+1)(x^2+2x-1) = 3x^3 + 6x^2 - 3x + x^2 + 2x - 1$
 $= 3x^3 + 7x^2 - x - 1$
 $\left(\frac{f}{g}\right)(x) = \frac{3x+1}{x^2+2x-1}$

14. $g(x) = (-x)^3 - 5$ Reflected over y-axis
move down 5.

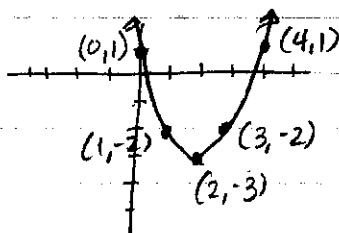
15. $h(x) = -(x-1)^3 + 3$

moves right 1, reflects over x-axis,
up 3

16. $y = \sqrt{x+2}$



17. $f(x) = (x-2)^2 - 3$
vertex (2, -3)



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

19. $h(x) = \sqrt{x-4}$

Domain: $x \geq 4$ Range: $y \geq 0$

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

Domain: \mathbb{R} Range: $y \leq 4$

Book: pg 524

26. $g(x) = 5x$
 $h(x) = 2x$

$g(h(x)) = 5(2x) = 10x$

$h(g(x)) = 2(5x) = 10x$

30. $g(x) = |x|$
 $h(x) = x-3$

$g(h(x)) = |x-3|$

$h(g(x)) = |x| - 3$

34. $f(x) = x^2$
 $h(x) = x-1$

$(f \circ h)(-3) = ((-3)-1)^2 = (-4)^2 = 16$

36a. $f(x) = x^2$
 $h(x) = x-1$

$h(f(-4)) = ((-4)^2) - 1 = 16 - 1 = 15$