Alg 2 - Notes

Key

Section 4.3 Day 3 Notes

Solve the following Quadratic Equations by Factoring:

1) $x^2 + x - 12 = 0$

$(x+4)(x-3) = 0$

$x = -4, 3$

2) $x^2 + 18x + 81 = 0$

$(x+9)(x+9) = 0$

$x = -9$

3) $x^2 - 12x + 27 = 0$

Zero product prop. ↘

$(x-9)(x-3) = 0$

$x-9=0 \quad x-3=0$

$x=9 \quad x=3$

9, 3

4) $x^2 - 4x - 32 = 0$

$(x-8)(x+4) = 0$

$x-8=0 \quad x+4=0$

$x=8 \quad x=-4$

8, -4

5) $x^2 - 25 = 0$

Diff. of two sq. ↘

$(x+5)(x-5) = 0$

$x+5=0 \quad x-5=0$

$x=-5 \quad x=5$

$-5, 5$

6) $4x^2 - 12x + 9 = 0$

$(2x-3)(2x-3) = 0$

$2x-3=0$

$2x=3$

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

Perfect Sq. Trinomial

7) $4x^2 - 16x + 7 = 0$

$(2x-1)(2x-7) = 0$

$2x-1=0 \quad 2x-7=0$

$2x=1 \quad 2x=7$

$x=\frac{1}{2} \quad x=\frac{7}{2}$

$\frac{1}{2}, \frac{7}{2}$

8) $4x^2 + 8x + 3 = 0$

$(2x+3)(2x+1) = 0$

$2x+3=0 \quad 2x+1=0$

$2x=-3 \quad 2x=-1$

$x=-\frac{3}{2} \quad x=-\frac{1}{2}$

$-\frac{3}{2}, -\frac{1}{2}$

Given the following roots, write the factored form of the quadratic function, then turn it into the Standard Form.

9) 3 and 4

Fact. Form: $(x-3)(x-4) = 0$

$x^2 - 3x - 4x + 12 = 0$

St. Form: $x^2 - 7x + 12 = 0$

10) 2 and -5

$(x-2)(x--5) = 0$

$(x-2)(x+5) = 0$ Factored form

$x^2 - 2x + 5x - 10 = 0$

$x^2 + 3x - 10 = 0$ Stand. form

11) -3 and -5

$(x--3)(x--5) = 0$

Fact. $(x+3)(x+5) = 0$

$x^2 + 3x + 5x + 15 = 0$

St. Form: $x^2 + 8x + 15 = 0$

12) -4 and 6

$(x--4)(x-6) = 0$

$(x+4)(x-6) = 0$ Fact. Form

$x^2 + 4x - 6x - 24 = 0$

$x^2 - 2x - 24 = 0$ St. Form

13. Use the following Quadratic Function to identify the axis of symmetry, vertex, y-intercept, solutions, domain, range, and graph:

$f(x) = x^2 - 2x - 8$ $a = 1$, $b = -2$, $c = -8$

Find the axis of symmetry: $-\frac{b}{2a} = x = \frac{2}{2} = 1$

Find the vertex: $(1, f(1))$ → $(1, -9)$ $f(1) = 1 - 2 - 8 = -9$

Name the y-intercept: $(0, c) = (0, -8)$

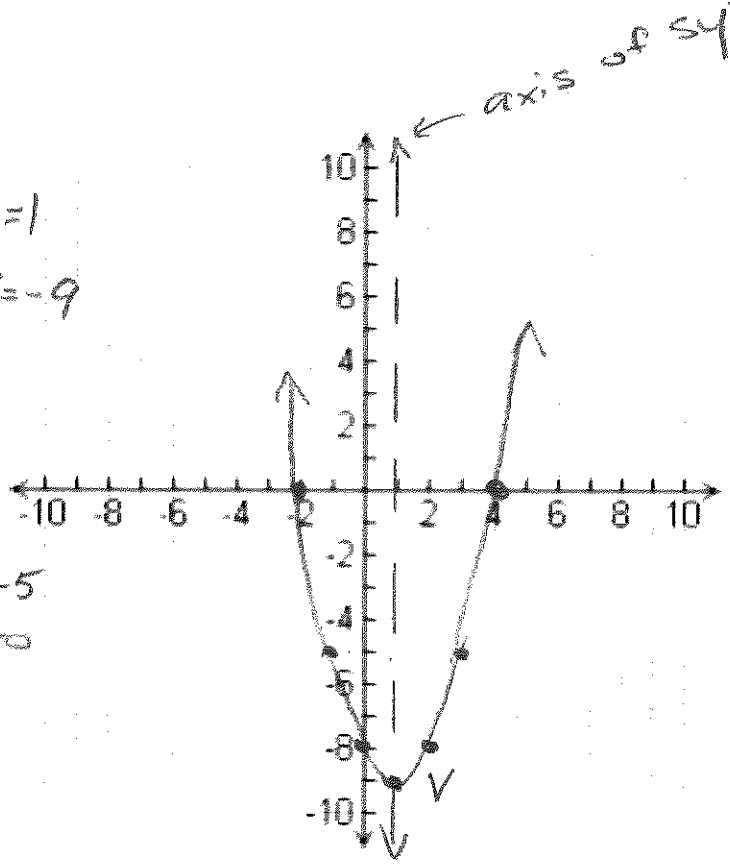
Reflection of the y-intercept: $(2, -8)$

Identify the solutions: $(4, 0)$ $(-2, 0)$

x	f(x)
3	$9 - 6 - 8 = -5$
4	$16 - 8 - 8 = 0$

Domain: All R's x's

Range: $y \geq -9$



14. Use the table to determine the location of the zeros of the quadratic function.

x	−7	−6	−5	−4	−3	−2	−1	0
f(x)	−8	−1	4	4	−1	−8	−22	−48

between x-values -6 & -5 and -4 & -3

15. The equation $h(t) = 64t - 16t^2$, where h(t) is the height of an object in feet and t is the time in seconds, is representing the height of a baseball.

$-16t^2 + 64t + 0$

- How long does it take for the ball to hit the ground? 4 seconds

$0 = 64t - 16t^2$
$= 16t(4 - t)$
at $t = 0$ + 4
start end up

x of vertex $\frac{b}{2a} = \frac{-64}{2(-16)} = 2$

- When did the ball reach its maximum height? Find vertex: (2, 64) @ 2 seconds

y of vertex $y = 64 \cdot 2 - 16 \cdot 2^2$
$= 128 - 16 \cdot 4$
$= 128 - 64 = 64$

- What was the ball's maximum height? 64 feet

- At what time did the ball reach the height of ~~240~~ 48 feet? at 1 and 3 seconds

$48 = 64t - 16t^2$
$0 = -16t^2 + 64t - 48$
$= -16(t^2 - 4t + 3)$
$= -16(t - 3)(t - 1)$