

10.1-10.3 (part 2)

Graphing & Solving Quadratic Functions

GOAL: Graph, describe, and solve quadratic functions

Factor and solve each quadratic equation:

1) $x^2 - 4 = 0$

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

$$x = -2 \quad x = 2$$

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

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

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

3) $x^2 - x - 6 = 0$

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

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

4) $-2x^2 + x + 1 = 0$

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

$a: 2, \quad c: -1$

$$-1(2x + 1)(x - 1)$$

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

5) $x^2 + 2x - 8 = 0$

$$(x+4)(x-2) = 0$$

$$x = -4 \quad x = 2$$

6) $x^2 + 7x + 6 = 0$

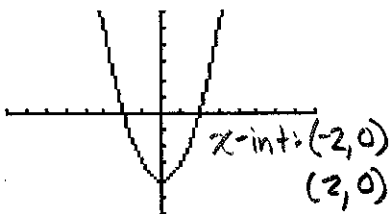
$$(x+6)(x+1) = 0$$

$$x = -6 \quad x = -1$$

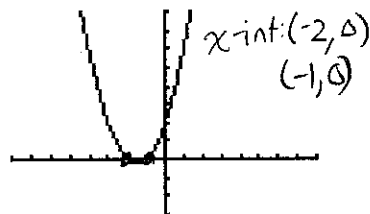
Now, compare these solutions to the graph of each quadratic function. What do you notice?

Solutions are just the x -int. of the corresponding functions

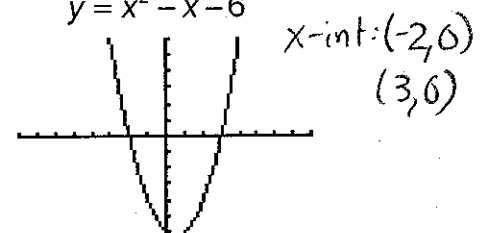
1) $y = x^2 - 4$



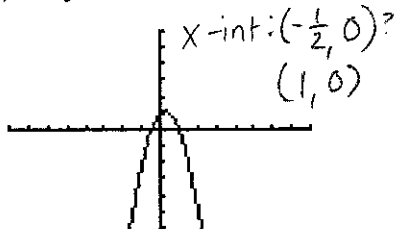
2) $y = x^2 + 3x + 2$



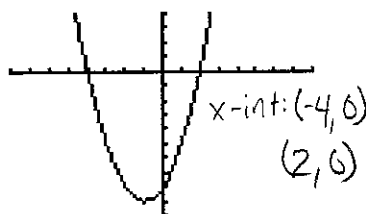
3) $y = x^2 - x - 6$



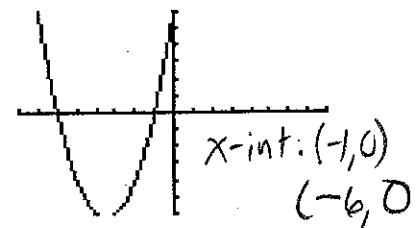
4) $y = -2x^2 + x + 1$



5) $y = x^2 + 2x - 8$



6) $y = x^2 + 7x + 6$



RECALL & CONNECTIONS: The solutions of a quadratic equation are called roots. These can also be found by finding the x -int. of the related parabola. These values are also called zeros of the quadratic function.

LESSON 10.3 Practice B
For use with pages 643-651

Determine whether the given value is a solution of the equation.

1. $x^2 - 2x + 15 = 0; 3$

$(3)^2 - 2(3) + 15 = 0$
 $9 - 6 + 15 \neq 0?$
No

2. $x^2 - 4x - 12 = 0; 2$

$(2)^2 - 4(2) - 12 = 0?$
 $4 - 8 - 12 = 0?$
No

3. $-x^2 - 5x - 6 = 0; 3$

$-(3)^2 - 5(3) - 6 = 0?$
 $-9 - 15 - 6 = 0?$
No

4. $x^2 + 3x - 4 = 0; 1$

$(1)^2 + 3(1) - 4 = 0?$
 $1 + 3 - 4 = 0?$
Yes

5. $2x^2 + 9x - 5 = 0; -2$

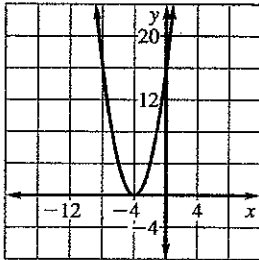
$2(-2)^2 + 9(-2) - 5 = 0?$
 $+ 8 - 18 - 5 = 0?$
No

6. $3x^2 - 5x - 2 = 0; 2$

$3(2)^2 - 5(2) - 2 = 0?$
 $12 - 10 - 2 = 0?$
Yes

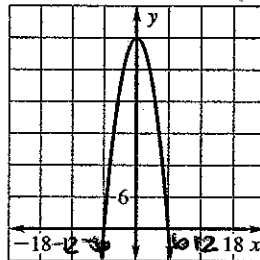
Use the graph to find the solutions of the given equation.

7. $x^2 + 8x + 16 = 0$



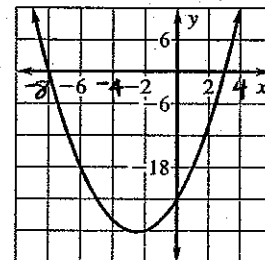
$x = -4$

8. $-x^2 + 36 = 0$



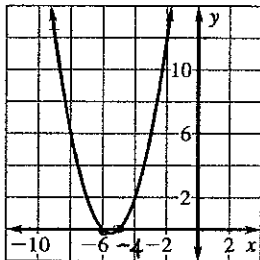
$x = -6, x = 6$

9. $x^2 + 5x - 24 = 0$



$x = -8, x = 3?$
Check: $(3)^2 + 5(3) - 24 = 0$
 $9 + 15 - 24 = 0$
 $0 = 0 \checkmark$

10. $x^2 + 11x + 30 = 0$

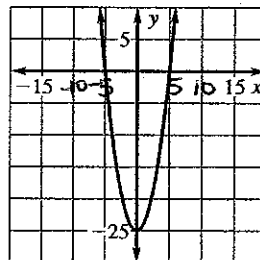


$x = -6, x = -5$

Check: $(-6)^2 + 11(-6) + 30 = 0$
 $36 - 66 + 30 = 0$
 $0 = 0 \checkmark$

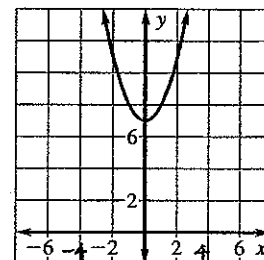
$(-5)^2 + 11(-5) + 30 = 0$
 $25 - 55 + 30 = 0$
 $0 = 0 \checkmark$

11. $x^2 - 25 = 0$



$x = -5$
 $x = 5$

12. $x^2 + 7 = 0$



None