

## **Algebra Lesson 9-7A The Quadratic Formula**

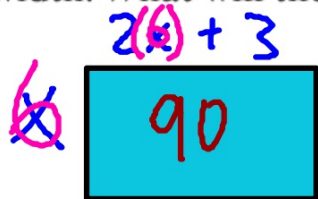
23) 6 ft x 15 ft

25) 2 and 3; or 7 and 8.

Due Monday: 9-7A p.466 #1, 3, 10 ,13

Due Today: p.454 # 23, 25

23. You are building a rectangular wading pool. You want the area of the bottom to be  $90 \text{ ft}^2$ . You want the length of the pool to be 3 ft longer than twice its width. What will the dimensions of the pool be?



$$6 \times 15$$

$$x(2x+3) = 90$$

$$2x^2 + 3x = 90$$

$$2x^2 + 3x - 90 = 0$$

$$\begin{array}{r} -180 \\ 15 \quad -12 \\ \hline 3 \end{array}$$

$$(x-6)(2x+15) = 0$$

↑  
6

$$2x+15=0$$

$$x = -\frac{15}{2}$$

|      |        |        |
|------|--------|--------|
|      | $x$    | $-6$   |
| $2x$ | $2x^2$ | $-12x$ |
| $15$ | $15x$  | $-90$  |

25. The product of two consecutive numbers is 14 less than 10 times the smaller number. Find each number.

$x$  = Smaller number

$x+1$  = larger number

7, 8

2, 3

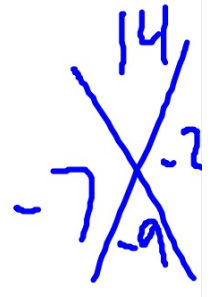
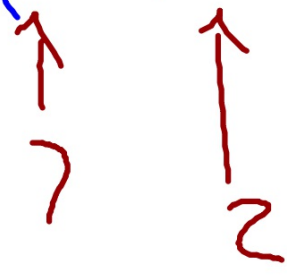
$$x(x+1) = 10x - 14$$

$$x^2 + x = 10x - 14$$

~~$-10x + 14$~~     ~~$-10x$~~     ~~$+14$~~

$$x^2 - 9x + 14 = 0$$

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



Find the roots:  $y = 2x^2 + 8x - 5$

?

~~$\frac{-10}{8}$~~

Find the roots:

$$\textcircled{1} = ax^2 + bx + c = 2x^2 + 8x - 5$$

Quadratic Formula

$$a = 2$$

$$b = 8$$

$$c = -5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-8 \pm \sqrt{(8)^2 - 4(2)(-5)}}{2(2)}$$

$$x = \frac{-8 \pm \sqrt{64 + 40}}{4}$$

$$x = \frac{-8 \pm \sqrt{104}}{4}$$

$$x = \frac{-8 + \sqrt{104}}{4} \quad \text{or} \quad \frac{-8 - \sqrt{104}}{4}$$

# Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x^2 + 4x = 32$$

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

$$a = 1$$

$$b = 4$$

$$c = -32$$

$$x = \frac{-4 \pm \sqrt{16 - 4(1)(-32)}}{2}$$

$$x = \frac{-4 \pm \sqrt{16 + 128}}{2}$$

$$x = \frac{-4 \pm \sqrt{144}}{2}$$

$$x = \frac{-4 + 12}{2} \quad \text{or} \quad \frac{-4 - 12}{2}$$

$$x = 4 \quad \text{or} \quad x = -8$$

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

Diagram illustrating the factoring process for  $x^2 + 4x - 32 = 0$ . The numbers 8 and 4 are shown with arrows pointing to the constant term -32 in the factored equation. The numbers 8 and 4 are also shown with arrows pointing to the coefficients 4 and -4 in the original equation  $x^2 + 4x - 32 = 0$ .

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Solve using the quadratic formula

1.  $2x^2 + 5x + 3 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

3.  $4x^2 - 12x + 9 = 0$

$a=2$   $x = \frac{-5 \pm \sqrt{25 - 4(2)(3)}}{4}$

10.  $5x^2 + 13x - 1 = 0$

$b=5$   
 $c=3$   
 $x = \frac{-5 \pm \sqrt{1}}{4}$

13.  $8x^2 - 3x - 7 = 0$

$x = \frac{-5+1}{4}$  or  $\frac{-5-1}{4}$

$x = -1$  or  $-\frac{6}{4} \rightarrow \frac{-3}{2}$