

LESSON 9-4 Factoring to Solve Quadratic Equations

1. $(v-4)(v-7) = 0$

$$\begin{array}{l} \underline{v-4=0} \quad \text{or} \quad \underline{v-7=0} \\ \underline{\frac{+4 \quad +4}{v=4}} \quad \underline{\frac{+7 \quad +7}{v=7}} \\ \underline{\{4, 7\}} \end{array}$$

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

$$\begin{array}{l} \underline{2x+3=0} \quad \text{or} \quad \underline{x-1=0} \\ \underline{2x=-3} \quad \underline{x=1} \\ \underline{x=-\frac{3}{2}} \end{array}$$

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

3. $t^2 + 3t - 54 = 0$

$$\begin{array}{l} \underline{(t+9)(t-6)=0} \\ \underline{t+9=0} \quad \text{or} \quad \underline{t-6=0} \\ \underline{t=-9} \quad \underline{t=6} \\ \underline{\{-9, 6\}} \end{array}$$

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

$$\begin{array}{l} \underline{(x-4)(x+3)=0} \\ \underline{x-4=0} \quad \text{or} \quad \underline{x+3=0} \\ \underline{x=4} \quad \underline{x=-3} \\ \underline{\{4, -3\}} \end{array}$$

You can check your answers by substituting each one into the equation

5. $3y^2 - 17y + 24 = 0$

(mult. 3:24)

$$\begin{array}{l} \underline{y^2 - 17y + 72 = 0} \\ \underline{(y-\frac{8}{3})(y-9)=0} \\ \underline{(3y-8)(y-9)=0} \\ \underline{3y-8=0} \quad \text{or} \quad \underline{y-9=0} \\ \underline{3y=8} \quad \underline{y=9} \\ \underline{y=\frac{8}{3}} \end{array}$$

$$\underline{\{\frac{8}{3}, 9\}}$$

6. $3x^2 + 13x - 4 = 0$

$$\begin{array}{l} \underline{3x^2 + 13x - 4 = 0} \\ \underline{x^2 + 13x - 12 = 0} \\ \underline{(x+\frac{12}{3})(x-1)=0} \\ \underline{x+4=0} \quad \text{or} \quad \underline{3x-1=0} \\ \underline{x=-4} \quad \underline{3x=-1} \\ \underline{x=-\frac{1}{3}} \\ \underline{\{-4, -\frac{1}{3}\}} \end{array}$$

7. You are making a rectangular table. The area of the table should be 10ft^2 . You want the length of the table to be 1 foot shorter than twice its width. What should the dimensions of the table be?

$$A = L \cdot w$$

$$10 = (2x - 1)(x)$$

$$10 = 2x^2 - x$$

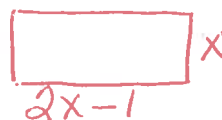
$$10 - 10 = 2x^2 - x - 10$$

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

$$0 = x^2 - x - 20$$

$$0 = (x - 5)(x + 4)$$

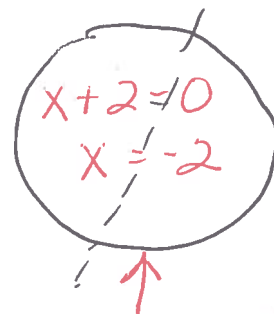
$$0 = (2x - 5)(x + 2)$$



$$2x - 5 = 0$$

$$2x = 5$$

$$x = 2.5\text{ft.}$$



not a possible answer
(it's negative)

8. Jason has a patio of uniform width around the perimeter of his rectangular pool. The pool measures 22 ft by 12 ft. If the area of the pool and the patio is 504ft^2 , what is the width of the patio?

$$504 = (2x + 22)(2x + 12)$$

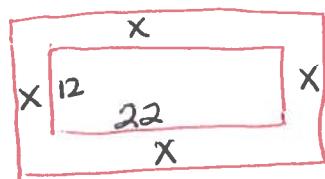
$$504 = 4x^2 + 68x + 264$$

$$-504 \quad -504$$

$$0 = 4x^2 + 68x - 240$$

$$0 = 4(x^2 + 17x - 60)$$

$$0 = 4(x + 20)(x - 3)$$



factor out the 4

$$x + 20 = 0$$

$$x = -20$$

$$x - 3 = 0$$

$$x = 3$$

The pool's patio is 3 feet wide.

can't have a negative width