

HW:

Quadratic Word Problems

Credited for you by Ms. Nhotsaubanh

1. A rectangle's width is five less than its length. Its area is 24 square centimeters. Find its dimensions.

$$\begin{array}{l} x \\ \boxed{A = 24 \text{ cm}^2} \\ x-5 \end{array}$$

$$\begin{array}{r} ac \\ -24 \\ \hline (-8) \quad (3) \\ \hline -5 \\ b \end{array}$$

Answer:

Width = 3 cm

Length = 8 cm

$$\begin{array}{r} A = LW \\ 24 = x(x-5) \\ 24 = x^2 - 5x \\ \hline -24 \qquad \qquad -24 \\ \hline 0 = x^2 - 5x - 24 \end{array}$$

$$\begin{array}{l} 0 = (x-8)(x+3) \\ x = 8 \end{array}$$

$x = -3$
reject
b/c you can not have a negative side

2. The length of a rectangle is 7 more than the width. Its area is 30. Find the dimensions of the rectangle.

$$\begin{array}{l} \boxed{A = 30} \\ x \end{array}$$

$$\begin{array}{r} x+7 \\ ac \\ -30 \\ \hline (10) \quad (3) \\ \hline 7 \end{array}$$

Answer:

Width = 3

Length = 10

$$\begin{array}{r} A = LW \\ 30 = x(x+7) \\ 30 = x^2 + 7x \\ \hline -30 \qquad \qquad -30 \\ \hline 0 = x^2 + 7x - 30 \end{array}$$

$$0 = (x+10)(x-3)$$

$$x = -10 \quad x = 3$$

reject
b/c you can not have a negative side

Name: _____
Alg. 1 H - Dec. 2

Key

Glue on page 45

3. Cassandra has two sisters. One of the sisters is 7 years older than Cassandra. The other sister is 3 years younger than Cassandra. The product of Cassandra's sisters' ages is 24. How old is Cassandra?

Let Cassandra's age = x
 Older sister's age = $x+7$
 Younger sister's age = $x-3$

Equation: $(x+7)(x-3) = 24$

$x(x-3) + 7(x-3) = 24$

$x^2 - 3x + 7x - 21 = 24$

$x^2 + 4x - 21 = 24$
 $-24 \quad -24$

$x^2 + 4x - 45 = 0$

$(x+9)(x-5) = 0$

4. Find two consecutive odd integers such that the square of the first, added to 3 times the second, is 24.

Let 1st COI = $x = 3$
 2nd COI = $x + 2 = 5$

Equation: $x^2 + 3(x+2) = 24$

$x^2 + 3x + 6 = 24$
 $-24 \quad -24$

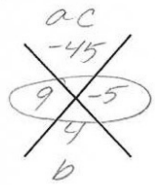
$x^2 + 3x - 18 = 0$

$(x+6)(x-3) = 0$

$x = -6$
 reject

$x = 3$

The 2 consecutive odd #s are 3 & 5



ANSWER: Cassandra is 5 years old.

5. Eight more than the square of a number is the same as 6 times the number. Find the number.

Let $x =$ a number

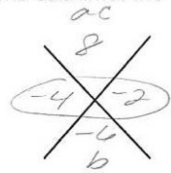
Equation: $x^2 + 8 = 6x$
 $-6x \quad -6x$

$x^2 - 6x + 8 = 0$

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

$x = 4 \quad x = 2$

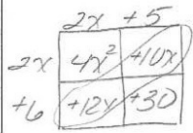
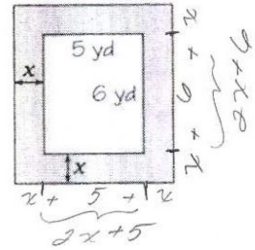
$x = \{4, 2\}$



The numbers are 4 & 2.

The deck is 8 yd

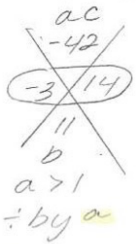
6. A rectangular pool measures 5 yd by 6 yd. A concrete deck of uniform width is constructed around the pool. The deck and pool together cover an area of 72 square yd. How wide is the deck?



$4x^2 + 22x + 30$

$2x + 6$
 $2(\frac{3}{2}) + 6$
 $3 + 6$

9 yd \rightarrow length



\div by a

$A = LW$

$72 = (2x+5)(2x+6)$

$72 = 4x^2 + 22x + 30$
 $-72 \quad -72$

$0 = 4x^2 + 22x - 42$

$0 = 2(2x^2 + 11x - 21)$

$2 \neq 0 \quad (x-3)(x+\frac{14}{2}) = 0$

$(2x-3)(x+7) = 0$

$2x-3 = 0$
 $+b + 3$
 $\frac{2x}{2} = \frac{3}{2}$
 $x = \frac{3}{2}$

$x = -7$
 reject
 $2x + 5$
 $2(\frac{3}{2}) + 5$
 $3 + 5$

8 yd \rightarrow width

b/c you can't have a neg. age

b/c it's not odd