

$$41.) -5x^2 + 5x - 85 = 0$$

$$\frac{-5(x^2 - x + 17) = 0}{-5}$$

$$x^2 - x + 17 = 0$$

Numbers/ Consecutive Integers

4. Find two positive consecutive odd integers such that the square of the first added to 3 times the second is 24. Set up a quadratic equation and solve algebraically.

$$\begin{array}{l} x \\ x+2 \end{array}$$

$$3, 5$$

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

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

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

$$x = 3, -6$$

5. The sum of the squares of two consecutive negative integers is 41. Find the integers. Set up a quadratic equation and solve algebraically.

$$\begin{array}{l} X \\ X+1 \end{array}$$

$$(X+1)(X+1)$$

$$-5, -4$$

$$X^2 + (X+1)^2 = 41$$

$$X^2 + X^2 + 2X + 1 = 41$$

$$2X^2 + 2X - 40 = 0$$

$$X^2 + X - 20 = 0$$

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

$$X = -5, 4$$

Area

6. The length of a rectangular photograph is 1 cm less than twice the width. The area is 45 square centimeters. Find the dimensions of the photograph. Set up a quadratic equation and solve algebraically.

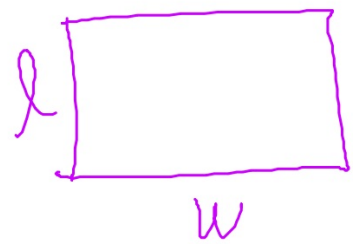
$$w(2w-1) = 45$$

$$2w^2 - w - 45 = 0$$

$$(2w + 9)(w - 5) = 0$$

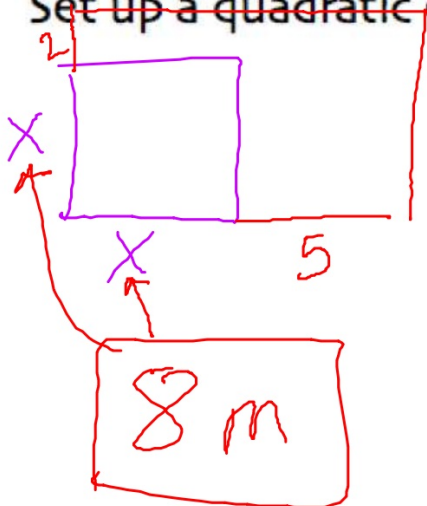
$$w = \cancel{9}, 5$$

5cm, 9cm



$$l = (2w - 1)$$

7. A square field has 5 meters added to its length and 2 meters added to its width. The new field has an area of 130 square meters. Find the length of a side of the original field. Set up a quadratic equation and solve algebraically.



$$(x+5)(x+2)=130$$

$$x^2+7x+10-130=0$$

$$x^2+7x-120=0$$

$$(x-8)(x+15)=0$$

$$x=8, -15$$

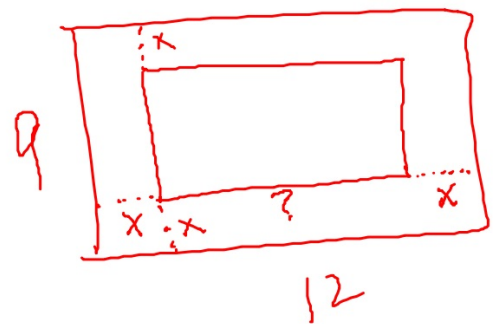
8. A decorator plans to place a rug in a 9 m by 12 m room so that a uniform strip of flooring around the rug will remain uncovered. How wide will this strip be if the area of the rug is to be half the area of the room? Set up a quadratic equation and solve algebraically.

$$(9-2x)(12-2x)=54$$

$$4x^2 - 42x + 54 = 0$$

$$(2x-3)(2x-18)=0$$

$$x = \frac{3}{2}, \quad \cancel{9}$$

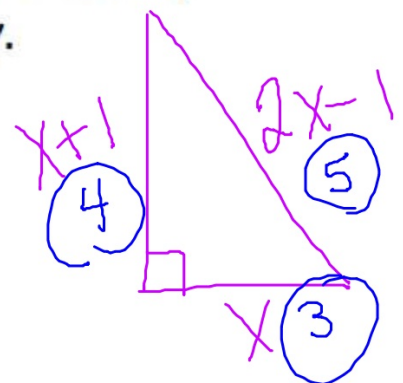


1.5 m

Miscellaneous

9. Suppose that one leg of a right triangle is 1 more than the other leg; and the hypotenuse is 1 less than 2 times the shorter leg. Find the lengths of all the sides. Set up a quadratic equation and solve algebraically.

$$\begin{aligned}a^2 + b^2 &= c^2 \\x^2 + (x+1)^2 &= (2x-1)^2 \\x^2 - 3x &= 0 \\x(x-3) &= 0 \\x &= \cancel{0}, 3\end{aligned}$$



3, 4, 5

11. Find three consecutive positive odd integers such that the product of the first and the third is 4 less than 7 times the second. Set up a quadratic equation and solve algebraically.

$$\begin{array}{l} X \\ X+2 \\ X+4 \end{array}$$

$$X(X+4) = 7(X+2) - 4$$

$$X = 5$$

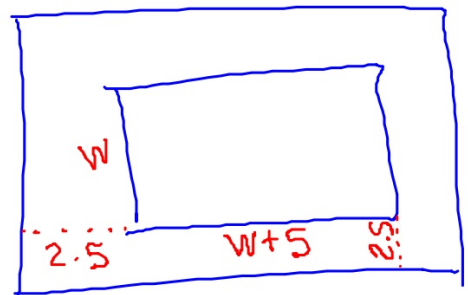
$$5, 7, 9$$

13. A frame for a picture is 2.5 inches wide. The picture enclosed by the frame is 5 inches longer than it is wide. If the area of the picture itself is 300 square inches, determine the outer dimensions of the frame. Set up a quadratic equation and solve algebraically.

$$W(W+5) = 300$$

$$W = 15$$

$$20\text{in} \times 25\text{in}$$



14. Abigail tosses a coin off a bridge into a stream. The distance, in feet, the coin is above the water is modeled by the equation $y = -16x^2 + 96x + 112$ where x represents time in seconds.

a) What is the greatest height of the coin?

$$x = \frac{-96}{2(-16)} = 3$$

$$y = 256 \text{ ft}$$

14. Abigail tosses a coin off a bridge into a stream. The distance, in feet, the coin is above the water is modeled by the equation $y = -16x^2 + 96x + 112$ where x represents time in seconds.

b) How much time will it take for the coin to hit the water?

$$0 = -16x^2 + 96x + 112$$

$$x = 7 \text{ sec}$$

Quiz topics:

Factoring

Completing the square

Quadratic formula

Square root

Discriminant

Complex numbers (simplify to standard form.

Quadratic word problems