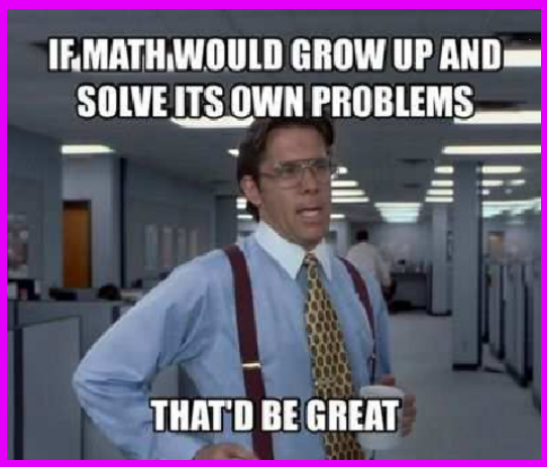
POLYNOMIAL WORD PROBLEM PRACTICE



A square has an unknown side length of x. A rectangle has a side length that is four feet longer than the square and a width that is two feet shorter than the square. The areas of both the square and the rectangle are equal. Find the side length of the square.

Area = length × width

$\text{Area}_{square} = \text{Area}_{rectangle}$

$x \cdot x = (x+4)(x-2)$

$x^2 = x^2 - 2x + 4x - 8$

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

$-x^2 \quad -x^2$

$0 = 2x - 8$

$+8 \quad +8$

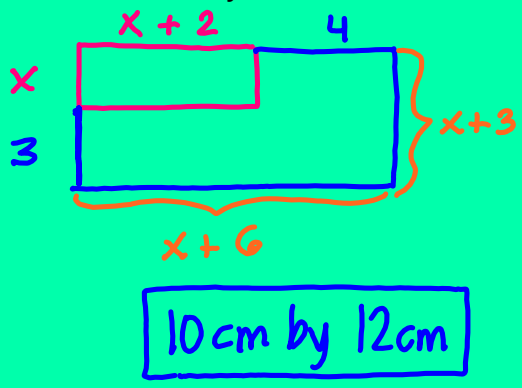
$\frac{8}{2} = \frac{2x}{2}$

$x = 4$

Side length of square = 4 ft

The length of a rectangle is 2 cm greater than the width. If the width is increased by 3 cm, and the length is increased by 4 cm, the area is increased by 88 cm ^{2}. Find the original dimensions of the rectangle.

L & W



10 cm by 12 cm

$\text{Area}_{original} + 88 = \text{Area}_{new}$

$x(x+2) + 88 = (x+3)(x+6)$ FOIL

$x^2 + 2x + 88 = x^2 + 6x + 3x + 18$

$x^2 + 2x + 88 = x^2 + 9x + 18$

$-x^2 \quad -x^2$

$2x + 88 = 9x + 18$

$-18 \quad -18$

$2x + 70 = 9x$

$-2x \quad -2x$

$70 = 7x$

$\frac{70}{7} = \frac{7x}{7}$

$10 = x$

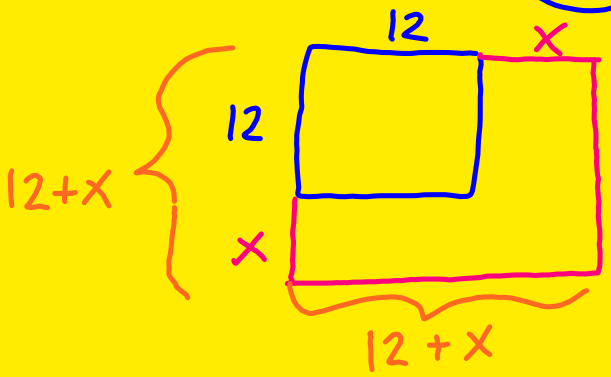
Dr. Walters has an office space that is in the shape of a square. The length of each wall is 12 feet. She wants to move to a larger office that is also in the shape of a square. If each wall in the larger office is x feet longer than 12 feet, which of the following expresses the area of the larger office space?

A. $(x^2 + 12)$ ft

B. $(x^2 + 144)$ ft

C. $(x^2 + 6x + 12)$ ft

D. $(x^2 + 24x + 144)$ ft

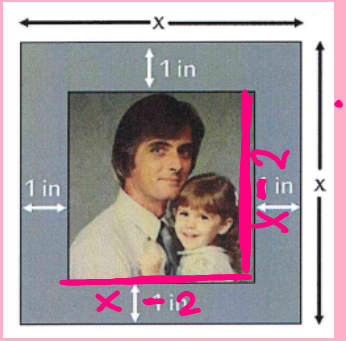


Area = L x W

Area = (12 + x)(12 + x)

To get a square photograph to fit into a square frame, Mrs. Wingard had to trim a 1-inch strip from each side of the photo, as shown below. In all, she trimmed off 40 square inches. What were the original dimensions of the photograph?

grey



Big Square − Small square = Grey Area

$x \cdot x - (x-2)(x-2) = 40$

$x^2 + (-x^2 + 4x + 4) = 40$

$4x - 4 = 40$

$+4 \quad +4$

$\frac{4x}{4} = \frac{44}{4}$

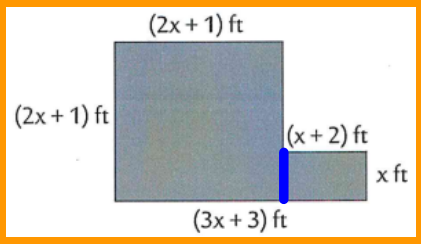
$x = 11$

11 in by 11 in

The figure below is made up of a square and a rectangle. What is the expression for the area of the mat border (the shaded region)?

A. $5x^2 + 6x + 1$ C. $9x + 7$

B. $5x^2 + 2x + 1$ D. $10x + 8$



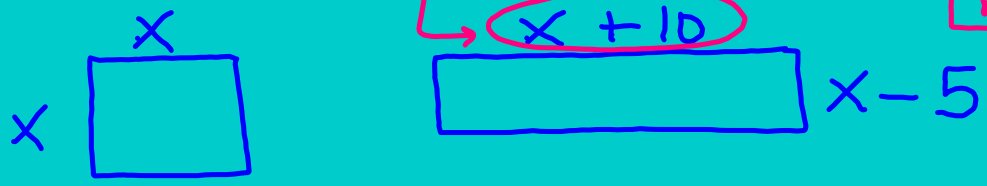
$\text{Area}_{sq.} + \text{Area}_{rect} = \text{Grey}$

$(2x+1)^2 + x(x+2) = \text{Grey}$

$4x^2 + 4x + 1 + x^2 + 2x = \text{Grey}$

$5x^2 + 6x + 1 = \text{Grey}$

Dave designs a square flower garden that has the same area as a rectangular one. The length of the rectangular garden is 10 feet longer than the side of the square garden. The width of the rectangular garden is 5 feet shorter than the side of the square. Find the length of the rectangular garden.



length of rect. = 20 ft

$\text{Area}_{sq} = \text{Area}_{rect.}$

$x \cdot x = (x + 10)(x - 5)$

$x^2 = x^2 - 5x + 10x - 50$

$x^2 = x^2 + 5x - 50$

$-x^2 \quad -x^2$

$0 = 5x - 50$

$50 = 5x$

$10 = x$

A mat border inside a picture fram has the following dimensions. What is the expression for the area of the mat border (the shaded region)?

A. $40w^2 + 4w$

C. $40w^2 - 20w$

B. $40w^2 - 20w - 16$

D. $40w^2 + 4w - 16$