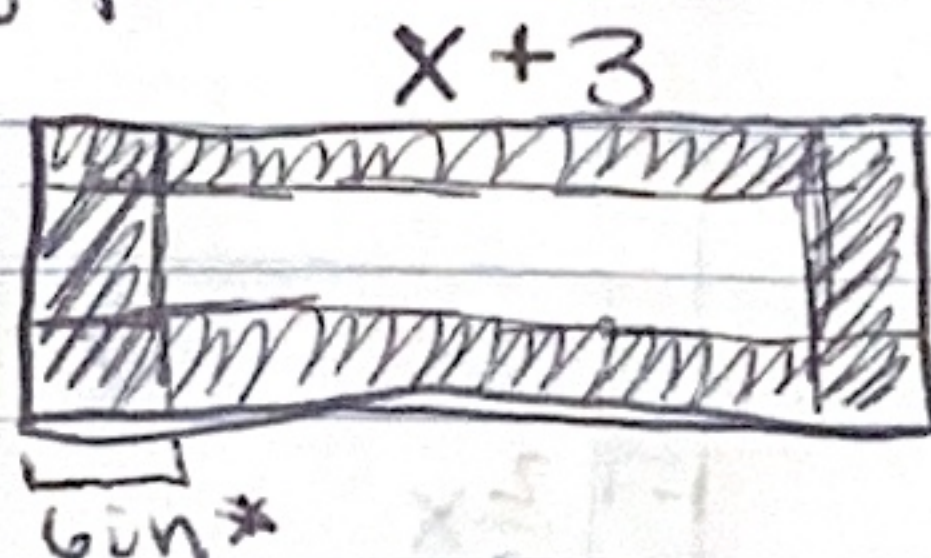


Word Problems

Ex) A rectangular table is 3ft longer than it is wide. If a strip of 6 in is cut from each side, the area of the table is reduced by 14 sq ft. Find the original dimensions.



$$6 \text{ in} = \frac{1}{2} \text{ ft}$$

	$A = l \cdot w$		
Original	$x(x+3)$	$x+3$	x
Reduced	$(x-1)(x+2) + 14$	$x+3-1$	$x-1$

take off 6 in strip from each side = a total of 1 ft

$$x(x+3) = (x-1)(x+2) + 14$$

$$x^2 + 3x = x^2 - x + 2x - 2 + 14$$

$$x^2 + 3x = x^2 + x + 12$$

$$2x = 12$$

$$x = 6$$

$$\text{Width} = 6 \text{ ft} \quad \text{length} = 9 \text{ ft}$$

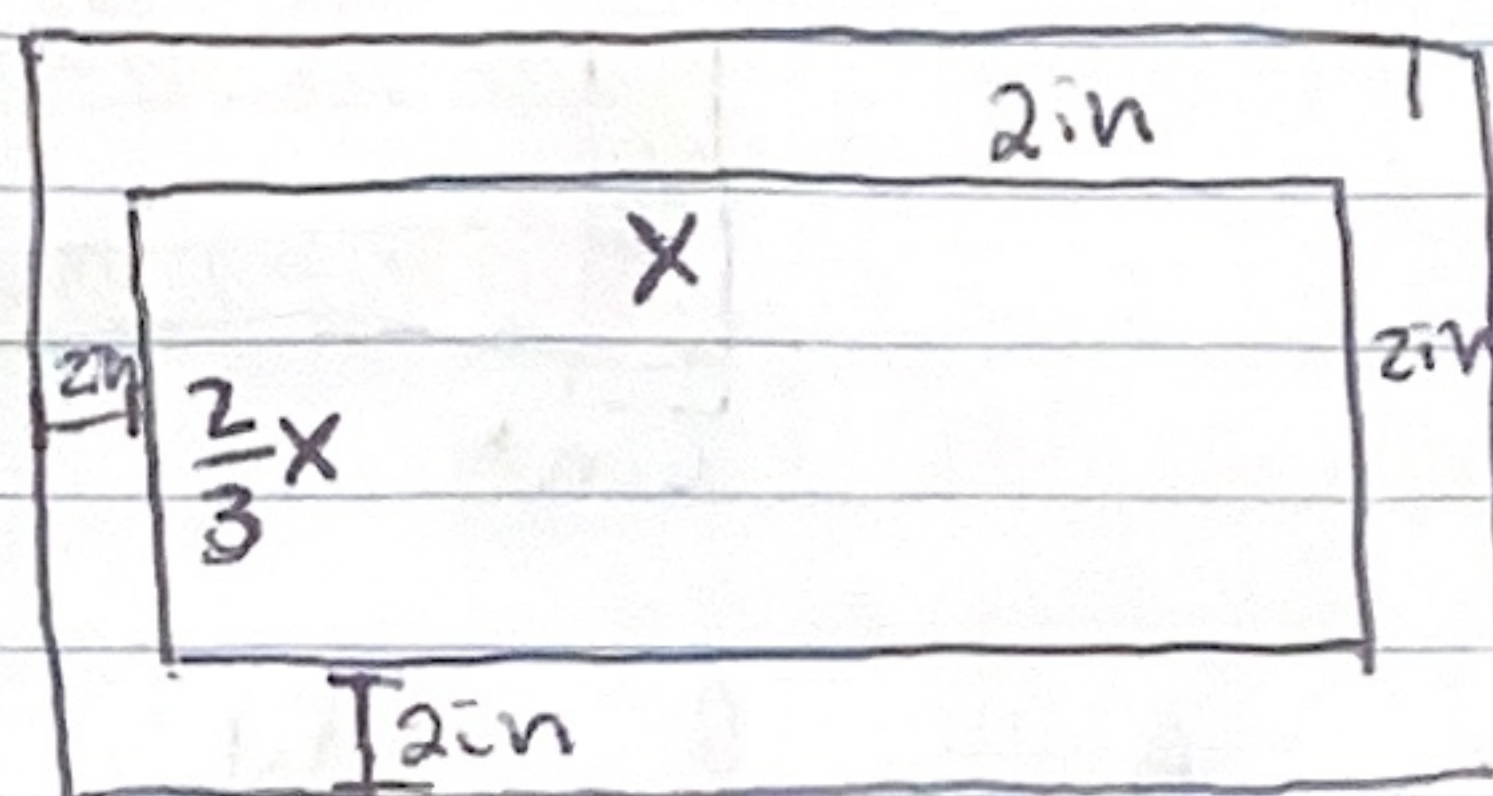
let $x = \text{the width (original)}$ } $A_1 = x(x+3)$
 $x+3 = \text{the original length}$
 $x-1 = \text{the reduced width}$ } $A_2 = (x-1)(x+2)$
 $x+3-1 = \text{the reduced length}$

How can we get A_1 to equal A_2 ?

$$A_1 = A_2 + 14$$

$$x(x+3) = (x-1)(x+2) + 14$$

Ex) The width of a rectangle is $\frac{2}{3}$ of its length. A border of width 2 in all around the rectangle has an area of 216 sq m. Find the dimensions of the rectangle.



let x = the length of the rectangle } A_1
 $\frac{2}{3}x$ = the width of the rectangle }
 $x+4$ = the length of the rectangle + border } A_2
 $\frac{2}{3}x+4$ = the width of the rectangle + border }

$$A_2 - A_1 = 216$$

~~Wanted~~

$$(x+4)(\frac{2}{3}x+4) - x(\frac{2}{3}x) = 216$$

$$\frac{2}{3}x^2 + \frac{8}{3}x + 4x + 16 - \frac{2}{3}x^2 = 216$$

$$\frac{8}{3}x + \frac{12}{3}x + 16 = 216$$

$$\frac{20}{3}x = 200$$

$$x = \frac{200 \cdot 3}{20}$$

$$x = 30 \text{ in}$$

$$\text{length} = 30 \text{ in} \quad \text{Width} = 20 \text{ in}$$