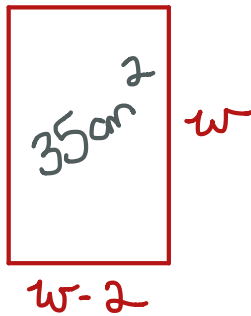NAME: _____ PERIOD: _____ DATE: _____

Homework Problem Set

Solve the following problems.

1. The length of a rectangle is 2 cm less than its width. If the area of the rectangle is 35 cm², find the width.

W=width
W-2=length

$35 cm^2$ w

$w-2$

$w(w-2) = 35$
$w^2 - 2w = 35$
$w^2 - 2w - 35 = 0$
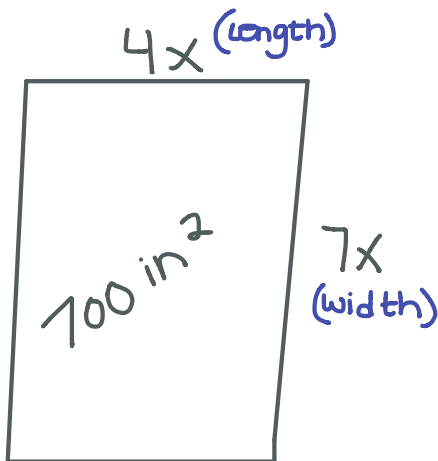$(w-7)(w+5) = 0$
$w = 7 \text{ or } -5$

↑
Not possible to have negative width

$W = 7cm$

2. The ratio of length to width (measured in inches) in a rectangle is 4 : 7. Find the length of the rectangle if the area is known to be 700 in².

$4x$ (length)

$700 in^2$ $7x$ (width)

$\dfrac{28x^2}{28} = \dfrac{700}{28}$

$\sqrt{x^2} = \sqrt{25}$

$x = \pm 5$

$x = 5 \text{ or } -5$

Length = $4x = 4(5) = 20 in$
width = $7x = 7(5) = 35 in$

3. One base of a trapezoid is three times the length of the second base. The height of the trapezoid is 2 in. smaller than the second base. If the area of the trapezoid is 30 in², find the lengths of the bases and the height of the trapezoid.

(Note: The area of a trapezoid is $A = \frac{1}{2}(b_1 + b_2)h$.)
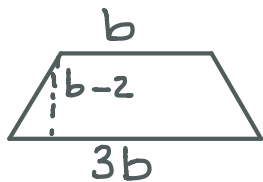
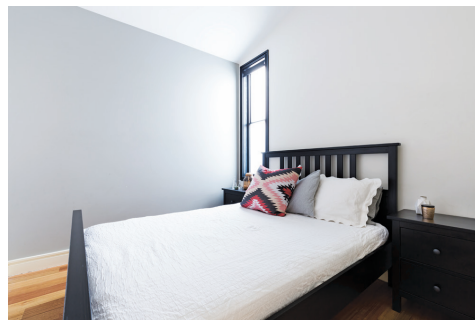$$30 = \frac{1}{2}(b + 3b)(b-2)$$
$$30 = \frac{1}{2}(4b)(b-2)$$
$$30 = 2b(b-2)$$
$$30 = 2b^2 - 4b$$
$$0 = 2b^2 - 4b - 30$$
$$0 = 2(b^2 - 2b - 15)$$
$$0 = 2(b-5)(b+3)$$
$$b = 5 \text{ or } \cancel{-3}$$

base 1 = 3(5) = 15 in
base 2 = 5 in
height = 5 - 2 = 3 in

4. A student is painting an accent wall in his room where the length of the wall is 3 ft. more than its width. The wall has an area of 130 ft². What are the length and the width, in feet?

130 ft²   (with dimensions w and w+3)

$$w(w+3) = 130$$
$$w^2 + 3w = 130$$
$$w^2 + 3w - 130 = 0$$
$$(w+13)(w-10) = 0$$
$$w = \cancel{-13} \text{ or } 10$$

© Jodie Johnson/Shutterstock.com

width = 10 ft
length = 13 ft

5. Find two consecutive even integers whose product is 80. (There are two pairs.) Be sure to show your work using algebraic methods.

n = even integer #1
n+2 = even integer #2

$$n(n+2) = 80$$
$$n^2 + 2n = 80$$
$$n^2 + 2n - 80 = 0$$
$$(n+10)(n-8) = 0$$
$$n = -10 \text{ or } 8$$

→ 8, 10
→ -10, -8