

Warm Up

April 9, 2019

1.) How many roots does the equation have?

no real roots

$$\begin{array}{r}
 x^2 + 64 = 0 \\
 \underline{-64 \quad -64} \\
 x^2 = -64
 \end{array}$$

PRIME

2.) Simplify: $(2xy^3z^4)^3(3x^4z^2)^2$

$$\begin{array}{l}
 (2)^3 (x^1)^3 (y^3)^3 (z^4)^3 \\
 (8x^3y^9z^{12})(9x^8z^4) \\
 72x^{11}y^9z^{16}
 \end{array}$$

3.) The tickets for a play are \$4 for students and \$6 for teachers. If the number of students is 3 more than 5 times the number of teachers and they paid \$376 to get in the play, how many students went to the play?

$x = \text{students}$
 $y = \text{teachers}$

$$\begin{array}{l}
 x = ? \\
 4x + 6y = 376 \\
 x = 3 + 5y
 \end{array}$$

$$\begin{array}{l}
 4(3 + 5y) + 6y = 376 \\
 12 + 20y + 6y = 376 \\
 26y + 12 = 376 \\
 \underline{-12 \quad -12} \\
 26y = 364
 \end{array}$$

$$\begin{array}{l}
 \frac{26y}{26} = \frac{364}{26} \\
 y = 14
 \end{array}$$

$$\begin{array}{l}
 x = 3 + 5(14) \\
 x = 3 + 70
 \end{array}$$

x = 73 students

Area Application Problems

1.) Given the diagram below, find the value of x if the area of the rectangle is 78 square meters.

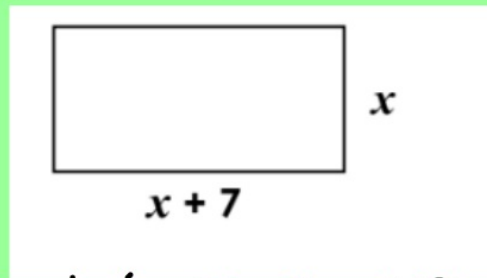
$$\begin{aligned} a &= lw \\ 78 &= (x)(x+7) \\ x^2 + 7x &= 78 \\ -78 \quad -78 & \end{aligned}$$

$$\hline x^2 + 7x - 78 = 0$$

$$(x-6)(x+13) = 0$$

$$x-6=0 \quad x+13=0$$

$$x=6 \quad x=-13$$



$$a=1 \quad b=7 \quad c=-78$$

$$\hline ac = -78$$

$$\begin{array}{r|l} -1 & 78 \\ -2 & 39 \\ -3 & 26 \\ -6 & 13 \end{array}$$

$$x = 6 \text{ m}$$

2.) Given the diagram below, find the dimensions of the rectangle if the area is 108 square meters.

$$a = l \cdot w$$

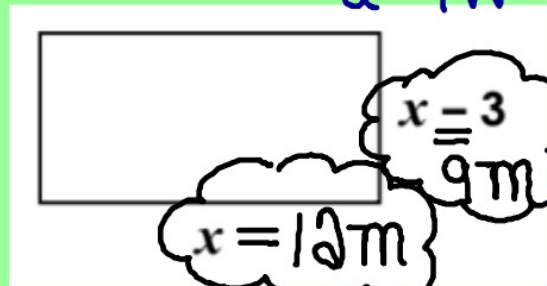
length
+
width

$$a = l \cdot w$$

$$108 = x(x-3)$$

$$x^2 - 3x = 108$$

$$-108 \quad -108$$



$$x^2 - 3x - 108 = 0$$

$$(x-12)(x+9) = 0$$

$$x - 12 = 0$$

$$\begin{array}{r} +12 \quad +12 \\ \hline x = 12 \end{array}$$

~~$$x + 9 = 0$$

$$\begin{array}{r} -9 \quad -9 \\ \hline x = -9 \end{array}$$~~

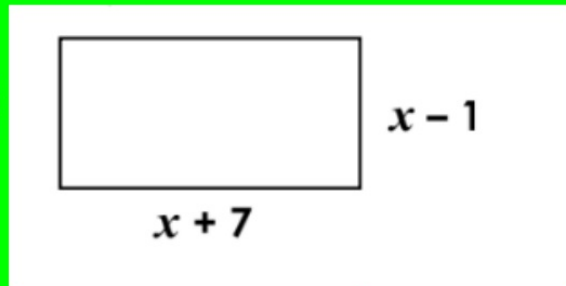
$$a = 1 \quad b = -3 \quad c = -108$$

$$ac = -108$$

1	108
-1	108
1	54
-1	54
1	27
-1	27
1	18
-1	18

-9	12
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3.) Find the dimensions of the rectangle below if the area is 128 square feet.



$$128 = (x-1)(x+7)$$

x	x^2	$-x$
+7	$7x$	-7

$$x^2 + 6x - 7 = 128$$

$$\quad \quad -128 \quad -128$$

$$x^2 + 6x - 135 = 0$$

$$(x-9)(x+15) = 0$$

$$x-9=0 \quad x+15=0$$

$$\frac{+9+9}{x=9} \quad \frac{-15-15}{x=-15}$$

$$x+7=L \quad W=x-1$$

$$9+7=L \quad W=9-1$$

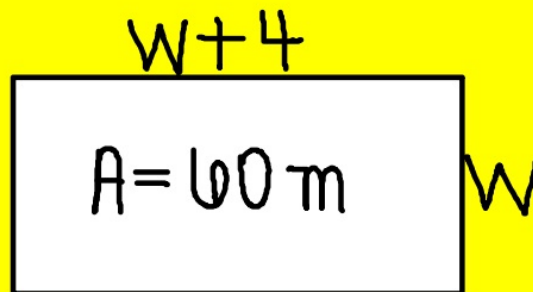
$$L=16 \text{ ft.} \quad W=8 \text{ ft.}$$

4.) The dimensions of a rectangle can be expressed as $x + 3$ and $x - 8$. If the area of the rectangle is 60 square inches, find the value of x .

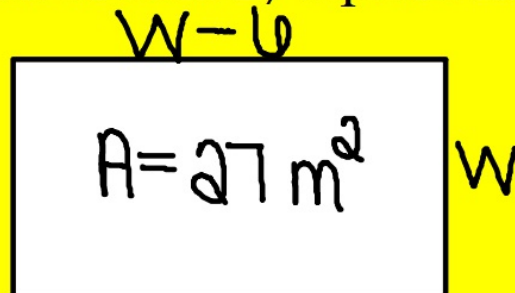
Draw a Picture!

5.) The ^Llength of a rectangular garden ⁼is 4 meters more than its width. The area of the rectangle is 60 meters. Find the dimensions of the rectangle.

L = length
W = width

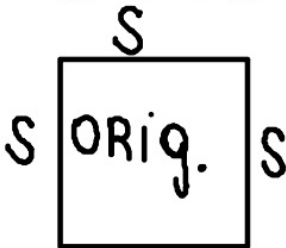


6.) The ^Llength of a rectangle ⁼is 6 meters less than its width. Find the dimensions of the rectangle if its area is 27 square meters.



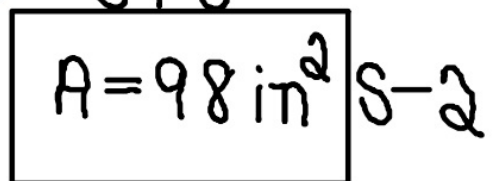
7.) A square is altered so that one dimension is increased by 5 inches and the other dimension is decreased by 2 inches. If the area of the resulting rectangle is 98 square inches, find the area of the original square.

$\rightarrow a=lw$



$a = S^2$
 $a = (9)^2$
 $a = 81 \text{ in.}^2$

$S+5$



$A = 98 \text{ in}^2$

$(S+5)(S-2) = 98$
 $S^2 + 3S - 10 = 98$
 $\quad \quad \quad -98 \quad -98$

 $S^2 + 3S - 108 = 0$
 $(S-9)(S+12) = 0$
 $S-9=0 \quad S+12=0$
 $S=9 \quad S=-12$

8.) Given the diagram to the left, if the area of the shaded region is 59 square inches, what are the dimensions of the outside rectangle?

