Warm-up: Solve the equations for x.

1. $\frac{x+8}{4} = 22$ ·4

$x+8=88$
$-8 \quad -8$
$x = 80$

2. $-(x+7)+3x=13$

$-x-7+3x=13$
$2x-7=13$
$+7 \quad +7$
$\frac{2x}{2}=\frac{20}{2}$
$x=10$

3. $23x+11-19x-4=12x-8-9x+11$

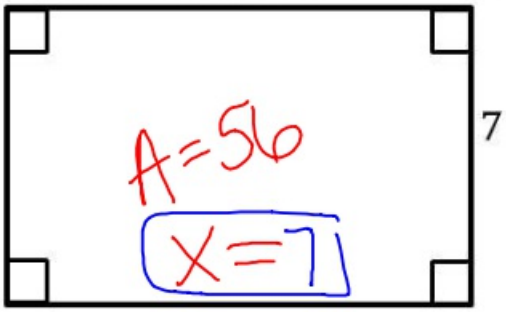
$4x+7=3x+3$
$-3x \quad -3x$
$x+7=3$
$-7 \quad -7$
$x=-4$

4. $\frac{3}{4}(8x-112)+72=4x+3-2x+17$

$6x-84+72=4x+3-2x+17$
$6x-12=2x+20$
$-2x \quad -2x$
$4x-12=20$
$+12 \quad +12$
$\frac{4x}{4}=\frac{32}{4}$
$x=8$

	Rectangle	Triangle
Perimeter measuring the length around a figure	Add all the sides	Add all the sides
Area measuring the space inside a 2D figure	$A = b \cdot h$	$A = \frac{1}{2}bh$ $A = \frac{bh}{2}$

Example 1: If the area of the rectangle below is 56 square units, find the value of x.



8

$\frac{2}{7}x+6=8$

$A=b\cdot h$

$56=\left(\frac{2}{7}x+6\right)\cdot 7$

$56=2x+42$

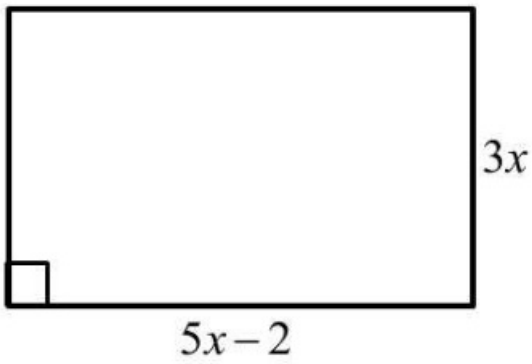
$-42 \quad -42$

$\frac{14}{2}=\frac{2x}{2}$

$7=x$

$X=7$

Example 2: Set up an expression that would calculate the area and perimeter of the rectangle.



Example 3: If the perimeter of the rectangle below is $x+12$ units, find the value of x.

$\frac{4}{10}$ $\frac{4}{10}$

$\frac{3}{10}x+2+\frac{2}{5}x+\frac{3}{10}x+2+\frac{2}{5}x=x+12$

$\frac{7}{5}x+4=x+12$

$-x \quad -x$

$\frac{2}{5}x+4=12$

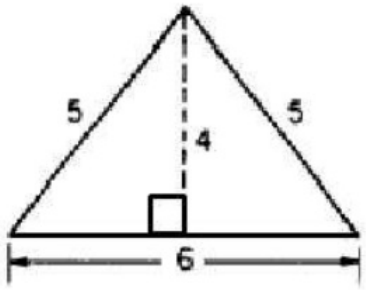
$-4 \quad -4$

$\frac{2}{5}x=8$

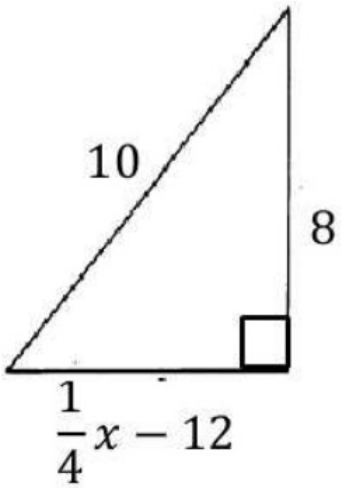
$\frac{2}{5} \quad \frac{2}{5}$

$x=20$

Example 4: Find the perimeter and area of the triangle.



Example 5: If the area of the triangle below is 48 square units, find the value of x.



$A = \frac{1}{2}bh$

$48 = \frac{1}{2}\left(\frac{1}{4}x - 12\right) \cdot 8$

$48 = \frac{1}{2} \cdot 8 \left(\frac{1}{4}x - 12\right)$

$2 \cdot 3 \cdot 4 = 3 \cdot 4 \cdot 2$

$2 \cdot 4 \cdot 3$

$48 = 4\left(\frac{1}{4}x - 12\right)$

$48 = x - 48$

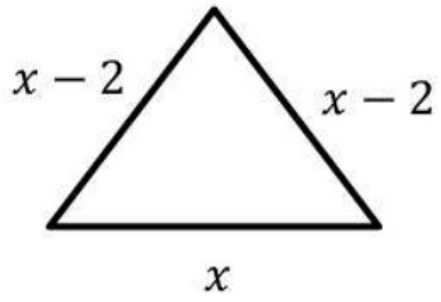
$+48 \quad +48$

$96 = x$

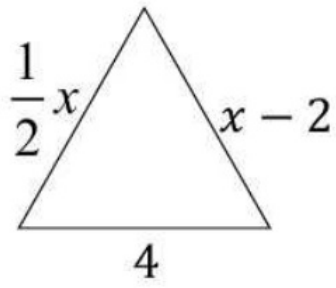
$\boxed{x = 96}$

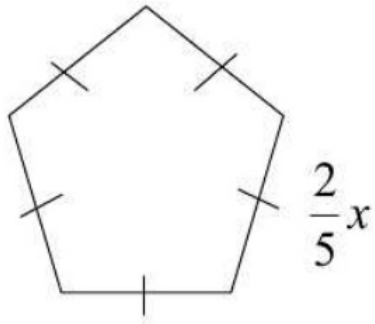
If the perimeter of the triangle is 32 units, find the value of x.

Example 6: If the perimeter of the triangle below is $(2x + 1)$ units, find the value of x.

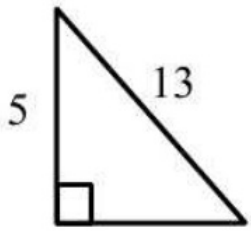


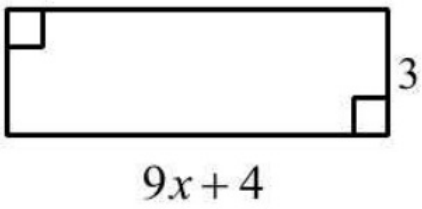
Example 7: Write an equation to find x so that the two polygons have the same perimeter. Then solve.





Example 8: Write an equation to find x so that the two polygons have the same area. Then solve.





$A = \frac{1}{2}bh$

$A = \frac{1}{2} \cdot 18x \cdot 5$

$A = 9x \cdot 5$

$A = 45x$

$A = bh$

$A = (9x+4)3$

$A = 27x + 12$

$45x = 27x + 12$ ★

$-27x \quad -27x$

$\frac{18x}{18} = \frac{12}{18}$

$x = \frac{2}{3}$ ★

$9 \cdot x \cdot 5$

$9 \cdot 5 \cdot x$

$45 \cdot x$

$45x$