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Writing and Solving Linear Equations

The image is a composite of three parts. On the left, a spiral-bound notebook shows three equations for the interior angles of a triangle: $m\angle 1 = x$, $m\angle 2 = 3x + 3\frac{1}{3}$, and $m\angle 3 = 2(3x + 3\frac{1}{3})$. Below the notebook is a triangle with a ruler and the text '180°'. On the right, a blackboard displays the same equations solved for x : $x + 3x + 3\frac{1}{3} + 2(3x + 3\frac{1}{3}) = 180$, followed by simplified versions: $x + 3x + 3\frac{1}{3} + 6x + 6\frac{2}{3} = 180$, $10x + 10 = 180$, and finally $10x = 170$.

- 1 Find solutions to geometric problems.
- 2 Solve the linear equation using the sum of interior angles of a triangle theorem.
- 3 Solve the equation using knowledge of linear equations and geometric properties.
- 4 Sort the steps needed to solve one variable linear equations in geometry.
- 5 Solve the word problems using linear equations and geometric properties.
- 6 Decide which statements are true.
- + with many hints, answer keys, and solution approaches for all tasks



The complete package, including all tasks, hints, solutions, and solution approaches, is available to all subscribers of [sofatutor.com](https://www.sofatutor.com)

Find solutions to geometric problems.

Fill in the blanks.

12 in

3 in

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

3 in

$x + 20^\circ$

x

$\boxed{5}$

$\boxed{6}$

$\boxed{1} \text{ in}$

$\boxed{3} \text{ in}$

$A = \boxed{4} \text{ in}^2$

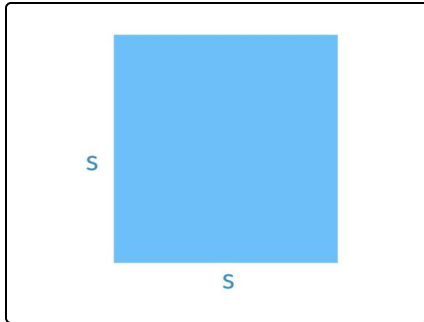
$\text{perimeter}_{\text{square}} = 24 \text{ in}$

Our hints for the tasks

1
from 6

Find solutions to geometric problems.

1. Hint

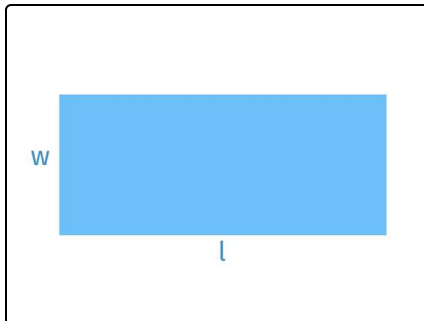


The perimeter of a square is given by $4s$ and the area is given by s^2 .

2. Hint

The sum of all interior angles of any triangle is 180 degrees. So, if one angle is a right angle, then the sum of the two other angles is 90° .

3. Hint



In a rectangle we can consider parallel lines of equal length.

The area is given by $A = lw$

Solutions and solution approaches for the tasks



Find solutions to geometric problems.

Answer key: 1: 12 // 2: 36 // 3: 6 // 4: 36 // 5*: 55° // 6*: 35°

***also correct:** 5: 55 // 6: 35

Rectangle:

- Three sides are given. The desired one has the same length as the corresponding parallel side. So it's 12 in.
- The area can be calculated by multiplying the side lengths: $A = (3 \text{ in})(12 \text{ in}) = 36 \text{ in}^2$.

Square:

- All sides have the same length, it's s .
- The perimeter is given by the formula $24 \text{ in} = 4s$. Dividing by 4 gives us the side length $= 6 \text{ in}$.
- Squaring the side length leads to the area $A = (6 \text{ in})^2 = 36 \text{ in}^2$.

Triangle:

- The represented triangle has a right angle. Thus the sum of the other two angles is 90° .
- This leads to the equation $x + x + 20 = 90$.
- Combining like terms and subtracting 20 results in $2x = 70$.
- Last we divide by 2 to get $x = 35^\circ$.
- The other angle is given by $x + 20^\circ = 55^\circ$.