

Algebra with geometry

State the geometric fact as an equation, then solve for the unknown.



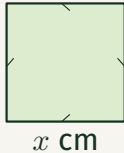
Name _____

Date _____

How to solve

Decide which geometry fact applies from the labelled diagram (an angle rule, a perimeter/area formula, a polygon fact, or a composite-shape split). Write it as an equation using the unknown, then solve. Check your answer makes sense – a length must be positive, an angle must be between 0° and 360° .

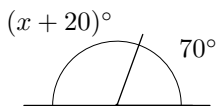
Worked example A square has side x cm. Its perimeter is 40 cm. Find x .



$$4x = 40$$

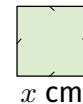
$$x = 10$$

1. Angles on a straight line are $(x + 20)^\circ$ and 70° . Find x .

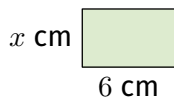


2. A right angle is split into x° and 35° . Find x .

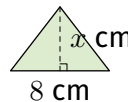
3. A square has side x cm and perimeter 28 cm. Find x .



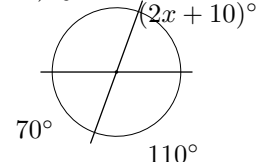
4. A rectangle has length 6 cm and width x cm. Its perimeter is 22 cm. Find x .



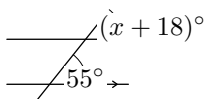
5. A triangle has base 8 cm and height x cm. Its area is 20 cm^2 . Find x .



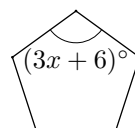
6. Vertically opposite angles are $(2x + 10)^\circ$ and 70° . Find x .



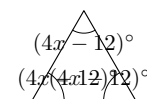
7. Corresponding angles are $(x + 18)^\circ$ and 55° . Find x .



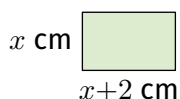
8. A regular pentagon has interior angle 108° . If an angle is labelled $(3x + 6)^\circ$, find x .



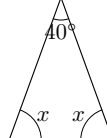
9. An equilateral triangle has each angle $(4x - 12)^\circ$. Find x .



10. A rectangle has width x cm and length $(x + 2)$ cm. If the perimeter is 18 cm, find x .



11. A triangle has angles x° , x° , and 40° . Find x .



12. A supplementary angle pair is $(5x)^\circ$ and 80° . Find x .

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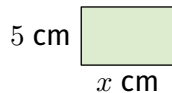
More practice: perimeter, area, angle, and polygon facts written as equations.



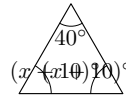
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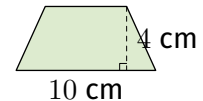
- 13.** A rectangle has area 30 cm^2 , width 5 cm , and length $x \text{ cm}$. Find x .



- 14.** An isosceles triangle has equal angles $(x + 10)^\circ$ and apex angle 40° . Find x .



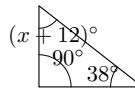
- 15.** The trapezium has area 28 cm^2 . Find x .
 $(x + 2) \text{ cm}$



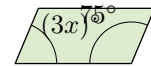
- 16.** A square has side $x \text{ cm}$. Its perimeter is 36 cm . Find x .



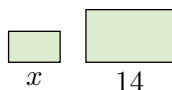
- 17.** A right-angled triangle has one acute angle $(x + 12)^\circ$ and the other 38° . Find x .



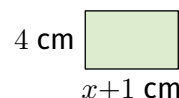
- 18.** A parallelogram has one interior angle $(3x)^\circ$ and the adjacent angle is 75° . Find x .



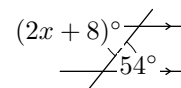
- 19.** A similar shape has scale factor 2. A side grows from $x \text{ cm}$ to 14 cm . Find x .



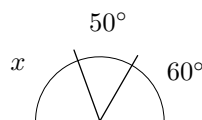
- 20.** A rectangle has length $(x + 1) \text{ cm}$ and width 4 cm . Its area is 24 cm^2 . Find x .



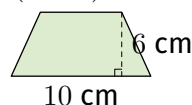
- 21.** Alternate angles are $(2x + 8)^\circ$ and 54° . Find x .



- 22.** Three angles on a straight line are x° , 50° , and 60° . Find x .



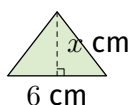
- 23.** The trapezium has area 48 cm^2 . Find x .
 $(x + 4) \text{ cm}$



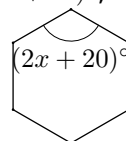
- 24.** A rectangle has perimeter 26 cm . Its length is $x \text{ cm}$ and width is 3 cm . Find x .



- 25.** A triangle has area 18 cm^2 , base 6 cm , and height $x \text{ cm}$. Find x .



- 26.** A regular hexagon has each interior angle 120° . If an angle is labelled $(2x + 20)^\circ$, find x .



- 27.** A regular octagon has interior angle 135° . If an angle is labelled $(5x - 10)^\circ$, find x .

