

Geometry & Measurement

KEY TERMS

Learn these words first. EQAO questions often test whether you understand what the math language means.

Perimeter

The total distance around a 2D shape.

Ex: add all side lengths

Area

The amount of flat surface inside a 2D shape.

Ex: measured in square units

Circumference

The perimeter of a circle.

Ex: distance around a circle

Radius

The distance from the centre of a circle to its edge.

Ex: r

Diameter

The distance across a circle through the centre; twice the radius.

Ex: $d = 2r$

Right Triangle

A triangle containing one 90-degree angle.

Ex: used with Pythagorean theorem

Hypotenuse

The longest side of a right triangle, opposite the 90-degree angle.

Ex: c in $a^2 + b^2 = c^2$

Leg

Either of the two shorter sides forming the right angle.

Ex: a and b

Pythagorean Theorem

A relationship between the three sides of a right triangle.

Ex: $a^2 + b^2 = c^2$

Prism

A 3D object with two congruent, parallel bases.

Ex: rectangular prism

Pyramid

A 3D object with one base and triangular faces meeting at a vertex.

Ex: square pyramid

Cylinder

A 3D object with two circular bases.

Ex: can-shaped object

Cone

A 3D object with one circular base and one vertex.

Ex: ice-cream cone shape

Surface Area

The total area of all outside faces or surfaces of a 3D object.

Ex: square units

Volume

The amount of space inside a 3D object.

Ex: cubic units

Composite Figure

A figure made from two or more simpler shapes.

Ex: rectangle + semicircle

Scale Factor

A multiplier that enlarges or reduces corresponding lengths.

Ex: factor of 2 doubles lengths

Unit Conversion

Rewriting a measurement in an equivalent unit.

Ex: $2.5 \text{ m} = 250 \text{ cm}$

KEY CONCEPTS & DEFINITIONS

Match the Measure to the Question

Around = perimeter/circumference; flat inside = area; outside of 3D = surface area; inside 3D = volume.

Name the measure before choosing a formula.

Units Reveal the Type

Length uses units, area uses square units, and volume uses cubic units. Incorrect units often reveal an incorrect answer.

cm, cm^2 , cm^3

Pythagorean Theorem Has a Condition

Use $a^2 + b^2 = c^2$ only for right triangles. The hypotenuse must be opposite the 90-degree angle.

Find c only after identifying the right angle.

Composite Shapes

Break a complicated figure into familiar shapes, calculate each part, then add or subtract as needed.

Draw dividing lines first.

Geometry & Measurement

FORMULAS & RULES

PYTHAGOREAN THEOREM

$$a^2 + b^2 = c^2$$

c is the hypotenuse.

CIRCLE

$$A = \pi r^2 \quad | \quad C = 2\pi r$$

Area is inside; circumference is around.

PRISM / CYLINDER VOLUME

$$V = \text{base area} \times \text{height} \quad | \quad V = \pi r^2 h$$

Volume uses cubic units.

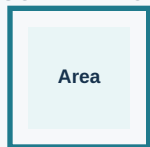
TRIANGLE AREA

$$A = (b \times h) / 2$$

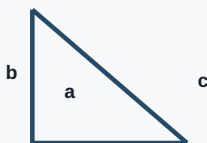
Base and perpendicular height are required.

VISUALS & FAST FACTS

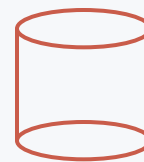
VISUAL MEMORY AID: WHAT ARE YOU MEASURING?



Perimeter = around



Right triangle



Volume = inside

FAST FACTS: Diameter = 2 x radius. | Convert units before substituting into a formula. | If every length doubles, area grows by 4 and volume by 8.

THREE WORKED EXAMPLES

Pythagorean Theorem

1

A right triangle has legs 6 cm and 8 cm. Find c.

- $c^2 = 6^2 + 8^2$.
- $c^2 = 36 + 64 = 100$.
- $c = \sqrt{100} = 10$.

ANSWER
10 cm

Circle Area

2

Find the area of a circle with radius 5 cm.

- $A = \pi r^2$.
- $A = \pi(5^2) = 25\pi$.
- 25π is about 78.5.

ANSWER
about 78.5 cm²

Cylinder Volume

3

A cylinder has $r = 3$ cm and $h = 10$ cm.

- $V = \pi r^2 h$.
- $V = \pi(3^2)(10) = 90\pi$.
- 90π is about 282.7.

ANSWER
about 282.7 cm³