

Edexcel - Foundation

Geometry and measures

2022 GCSE Advance Information

Sparx Topics & Key Questions

We are always looking for ways to support maths teachers and students. In order to help you and your year 11s this year we've pulled together a list of key questions which may be useful to practise with your students based on the exam board topic lists.

These 88 key questions are all taken from our library of over 45,000 high-quality questions in Sparx Maths. If you are a Sparx Maths School then your students can use the Topic Codes provided to search the full content library directly within the independent learning section of Sparx Maths to help target their revision.

Please note this is not an exhaustive topic guide it is simply designed to help you pull together some key questions to use to check for understanding in lessons, starters, or as worksheets with your learners.



Geometry and measures	Topics	Sparx Topic Codes
<u>Shape</u>	<u>Triangle properties</u>	U121
	<u>Quadrilaterals</u>	U121
	<u>Polygons</u>	U121
	<u>Triangular prism</u>	U719
	<u>Circles</u>	U767, U604, U950
	<u>Parallel and perpendicular lines</u>	U121
	<u>Reflection</u>	U799
	<u>Transformations</u>	U196, U799, U696, U519, U766
	<u>Plan and elevation</u>	U743
	<u>Angles</u>	<u>Angles in a triangle</u>
<u>Vertically opposite angles</u>		U730
<u>Angle properties of parallel lines</u>		U826
<u>Angles in a polygon</u>		U427
<u>Bearings</u>		U525, U107
<u>Length, area, and volume</u>	<u>Area of a rectangle</u>	U993
	<u>Area of a triangle</u>	U945, U343
	<u>Area of a trapezium</u>	U265, U343

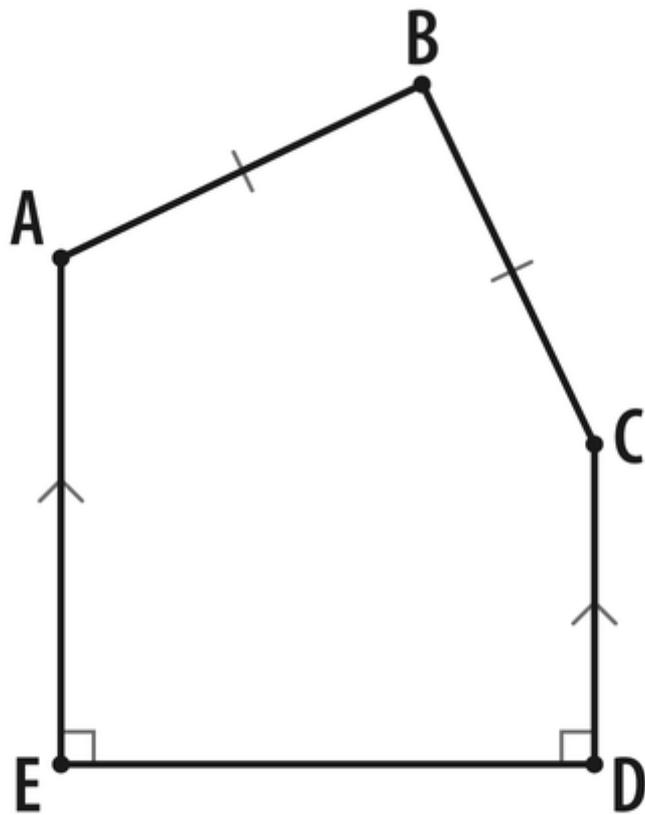
Geometry and measures	Topics	Sparx Topic Codes
<u>Length, area, and volume</u>	<u>Volume of a cube</u>	U786
	<u>Volume of a cylinder</u>	U915
<u>Pythagoras's Theorem and Trigonometry</u>	<u>Pythagoras's Theorem</u>	U385
	<u>Exact trigonometric values</u>	U627

Shape - Triangle properties

Line and shape properties

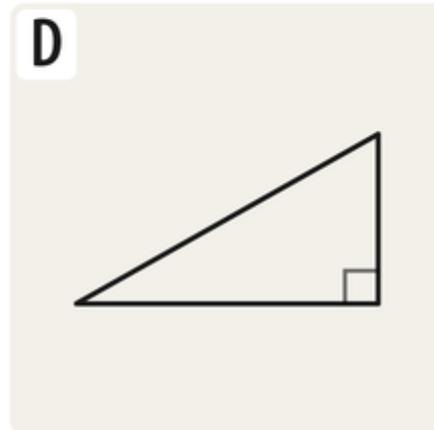
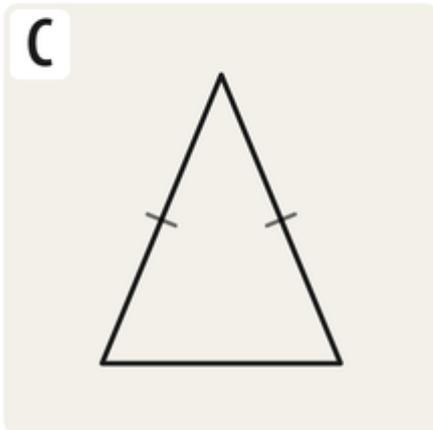
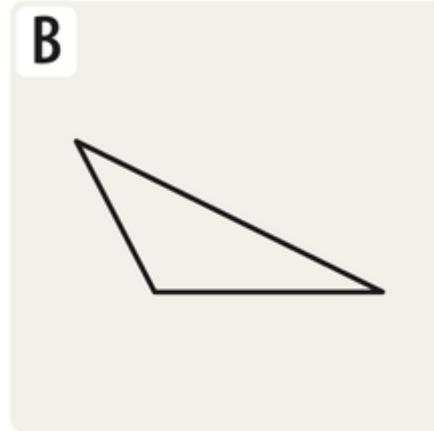
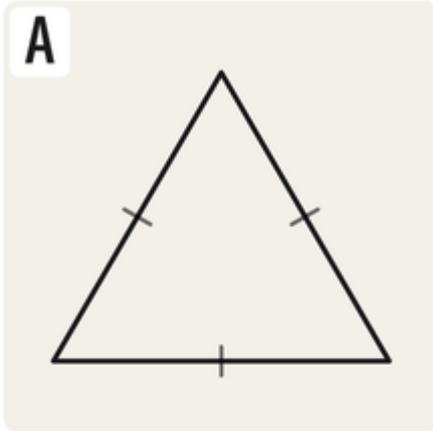
U121

- a) Which two line segments are parallel to each other?
- b) Which two line segments are equal lengths?
- c) How many line segments are perpendicular to another line segment?

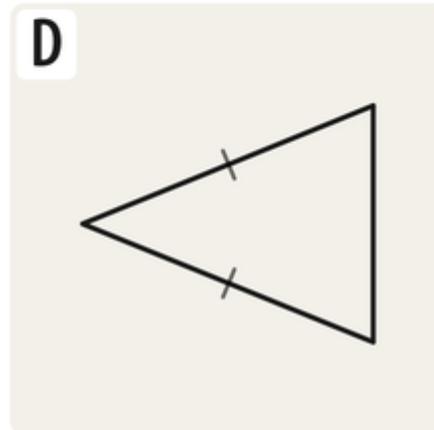
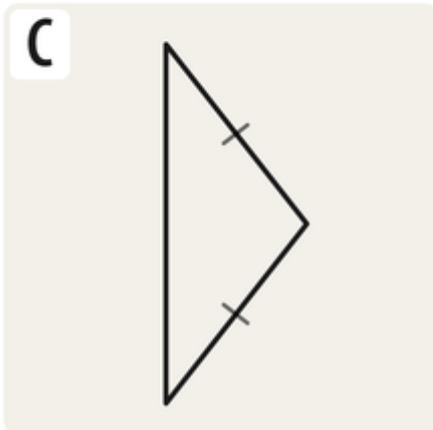
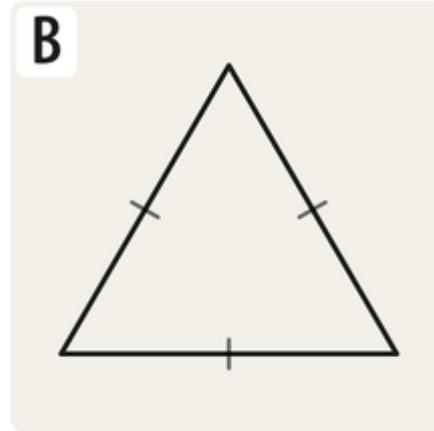
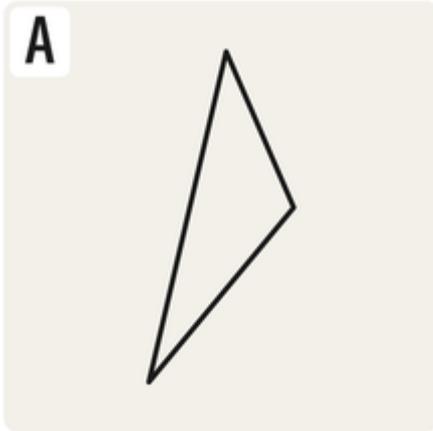


Not drawn accurately

Which of these is a right-angled triangle?



What is the mathematical name for each of the triangles below?



Match up the polygons shown below to their names.

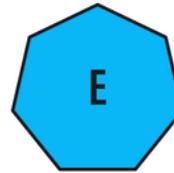
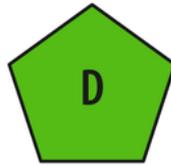
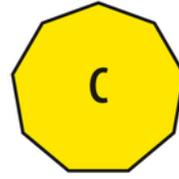
Pentagon

Nonagon

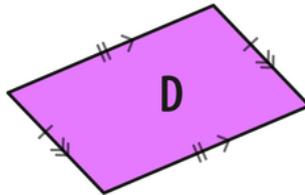
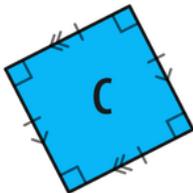
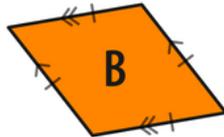
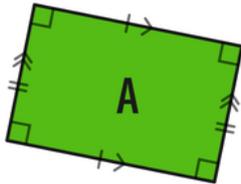
Hexagon

Octagon

Heptagon



Match each shape below with its mathematical name.



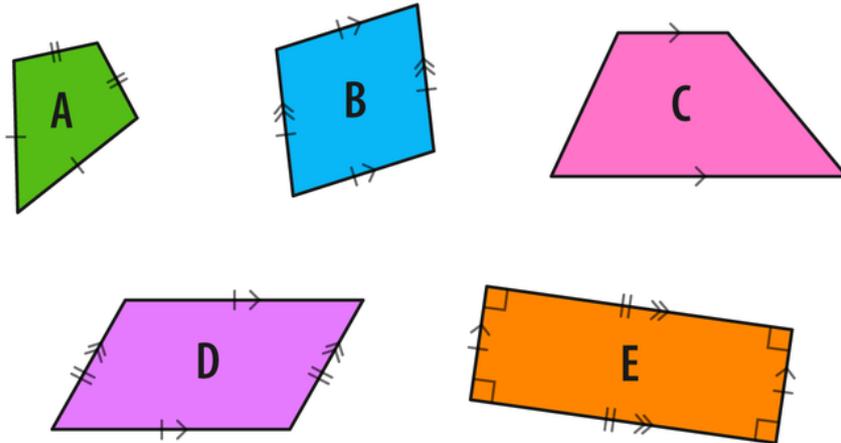
Rhombus

Square

Rectangle

Parallelogram

Which shape below is a trapezium?



A type of quadrilateral has four equal-length sides and four right angles.

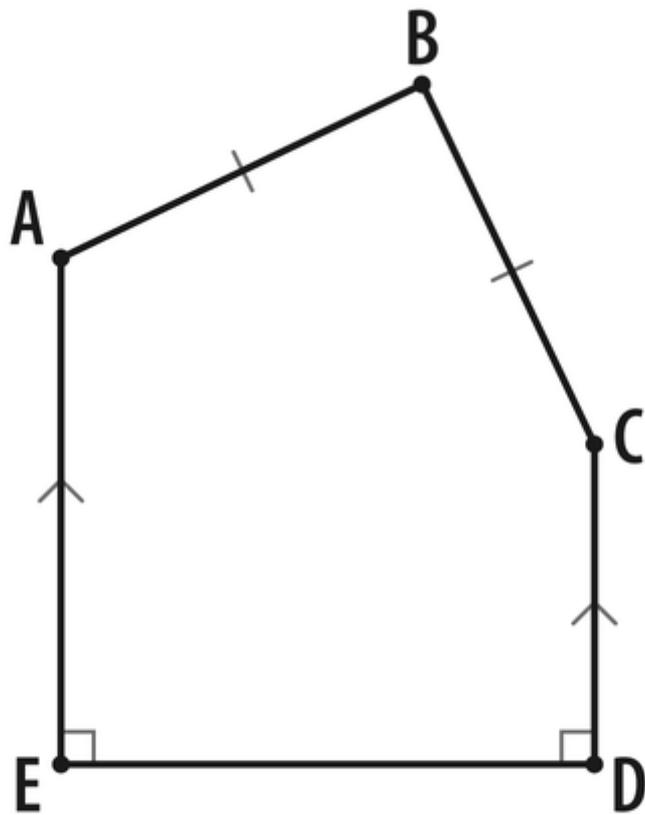
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Shape - Quadrilaterals

Line and shape properties

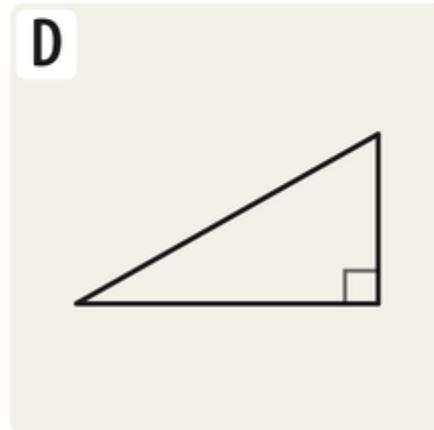
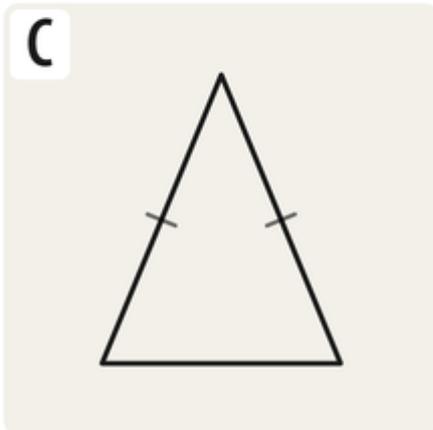
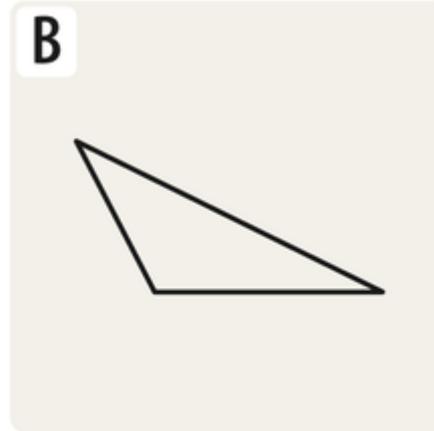
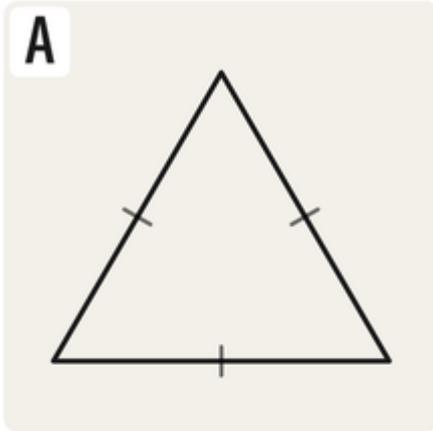
U121

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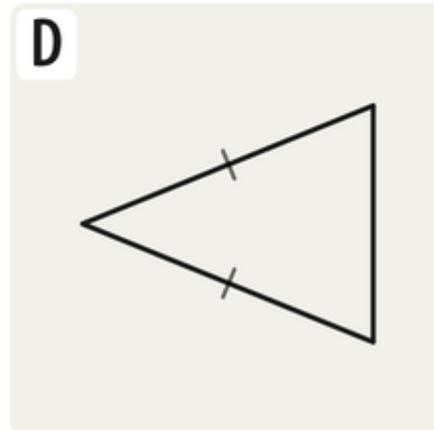
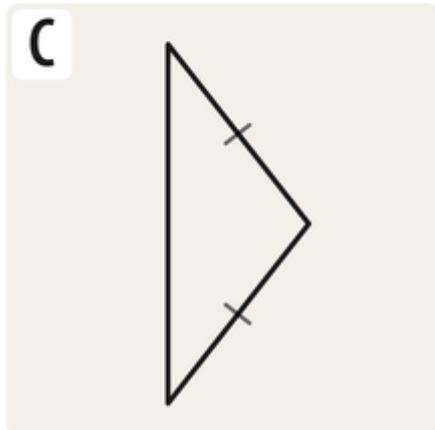
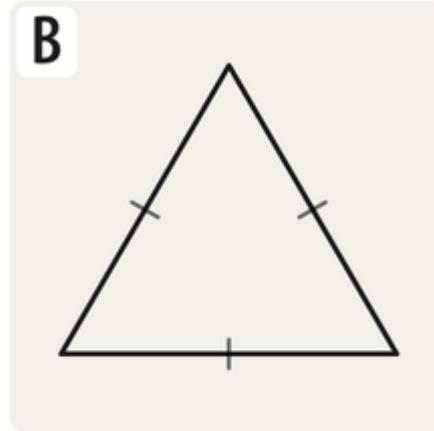
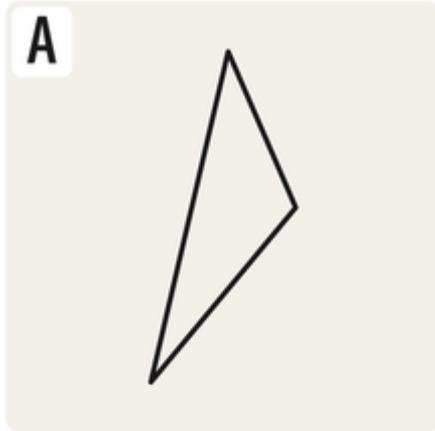


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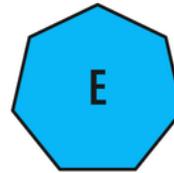
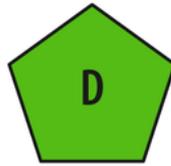
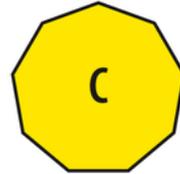
Pentagon

Nonagon

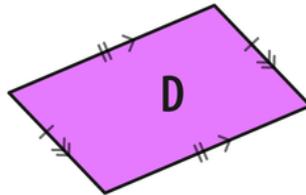
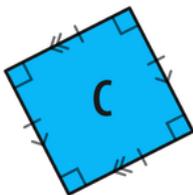
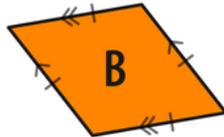
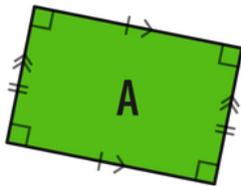
Hexagon

Octagon

Heptagon



Match each shape below with its mathematical name.



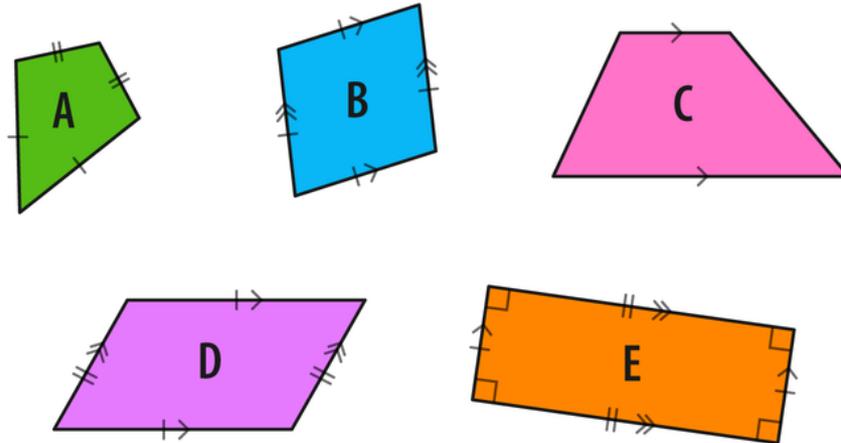
Rhombus

Square

Rectangle

Parallelogram

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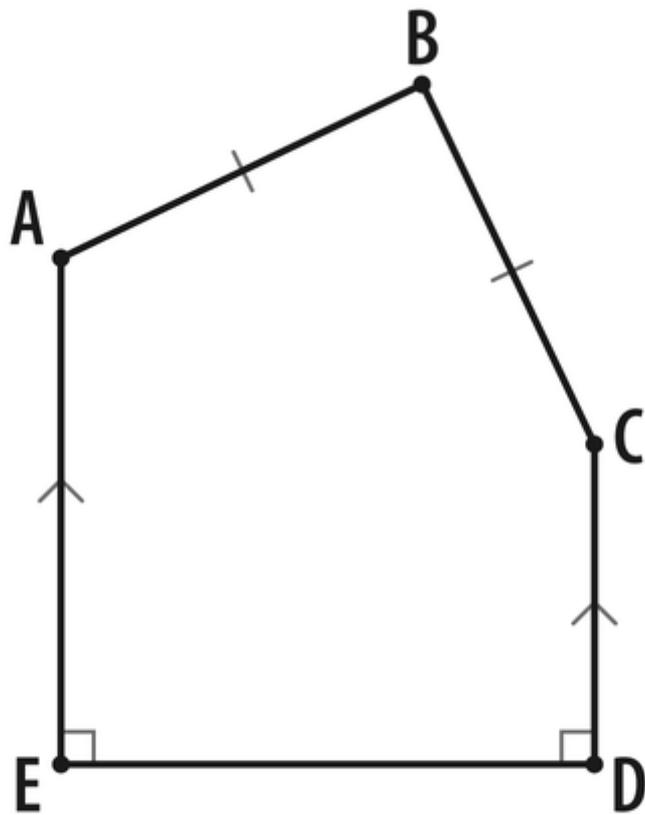
What is the mathematical name for this quadrilateral?

Shape - Polygons

Line and shape properties

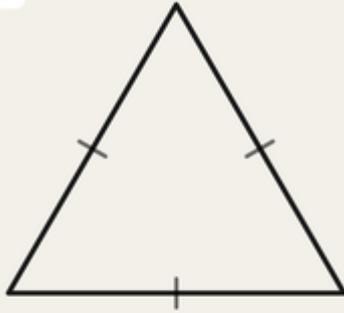
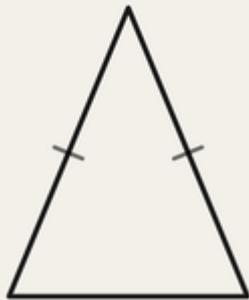
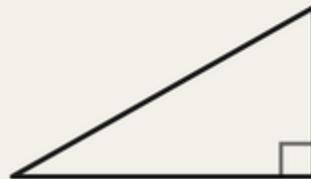
U121

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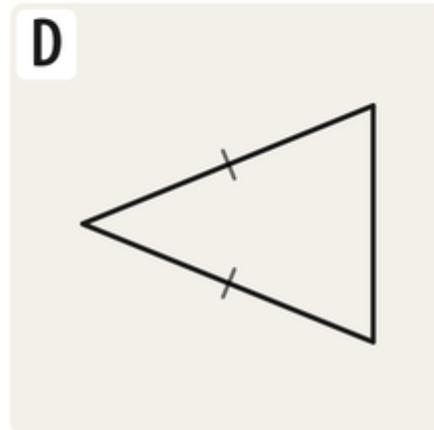
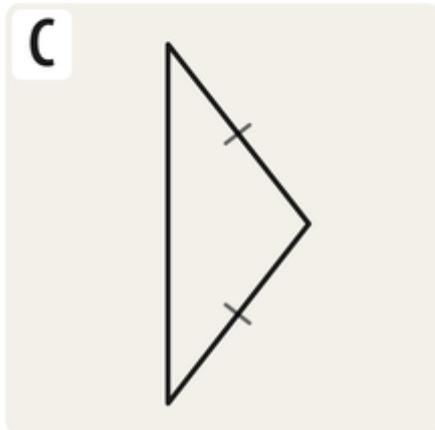
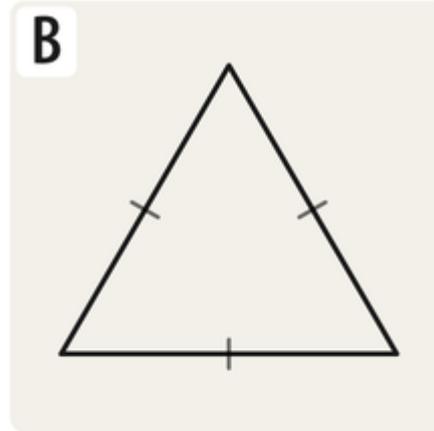
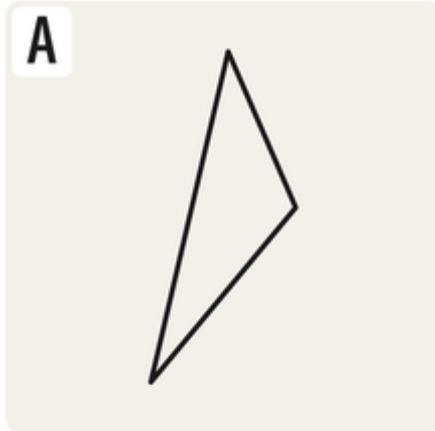


Not drawn accurately

Which of these is a right-angled triangle?

A**B****C****D**

What is the mathematical name for each of the triangles below?



Match up the polygons shown below to their names.

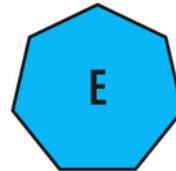
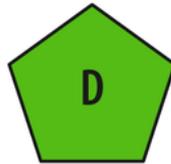
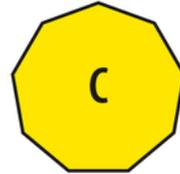
Pentagon

Nonagon

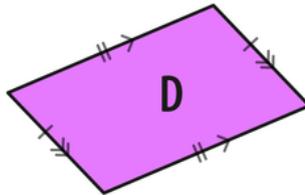
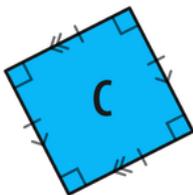
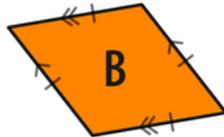
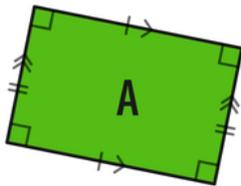
Hexagon

Octagon

Heptagon



Match each shape below with its mathematical name.



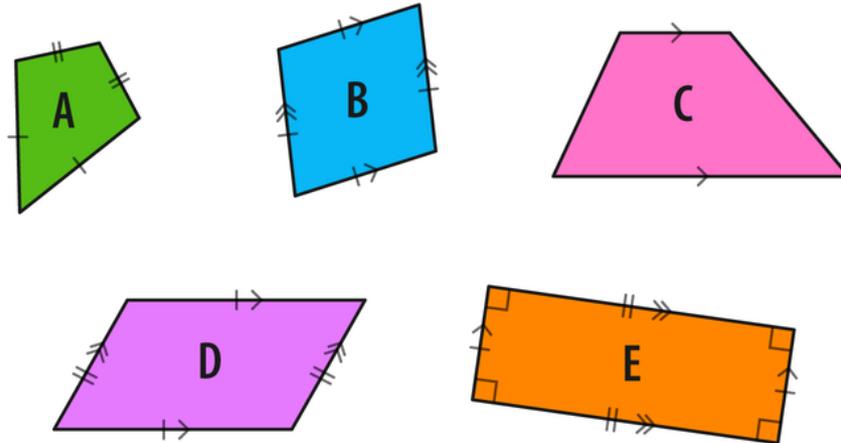
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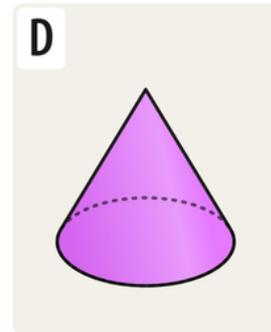
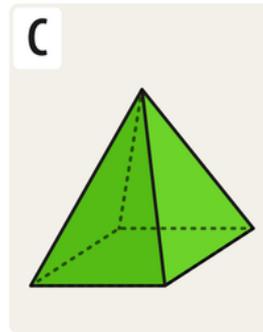
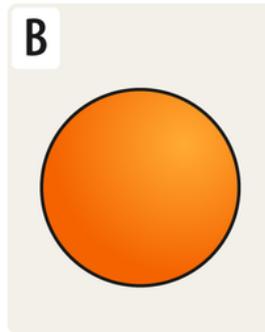
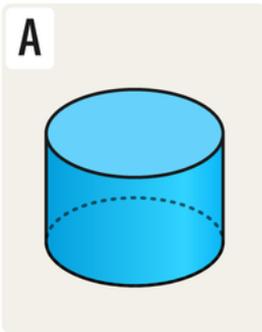
What is the mathematical name for this quadrilateral?

Shape - Triangular prism

Properties of 3D shapes

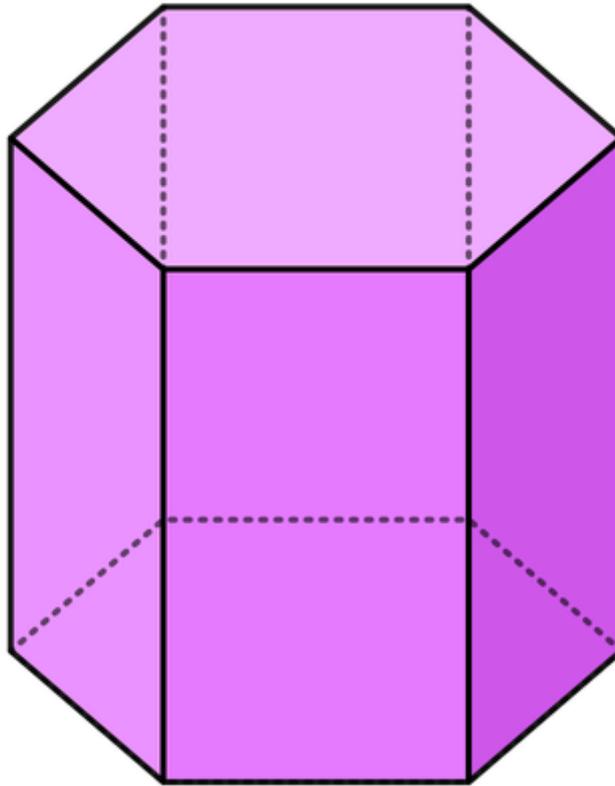
U719

What is the mathematical name for each shape?



a) What is the mathematical name of the 3D shape below?

b) How many **faces** does it have?



Shape - Circles

Identifying parts of circles

U767

Match each definition below with the part of a circle that it describes.

a) A straight line between two points on the edge of a circle that goes through the centre of the circle

Circumference

b) The distance around the edge of a circle

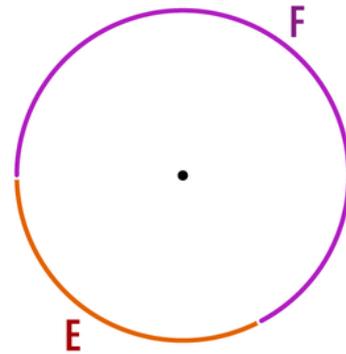
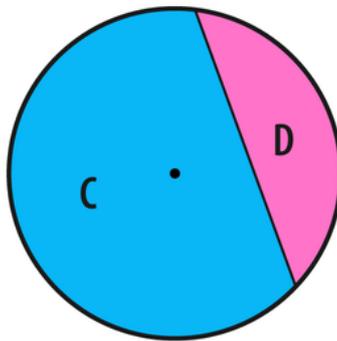
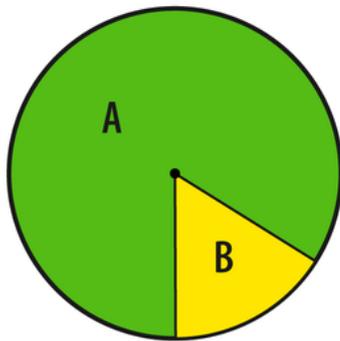
Radius

c) A straight line from the centre of a circle to a point on the edge of the circle

Diameter

From the diagram below, choose the correct letter for each the following parts of a circle:

- a) a major arc
- b) a minor sector
- c) a major segment

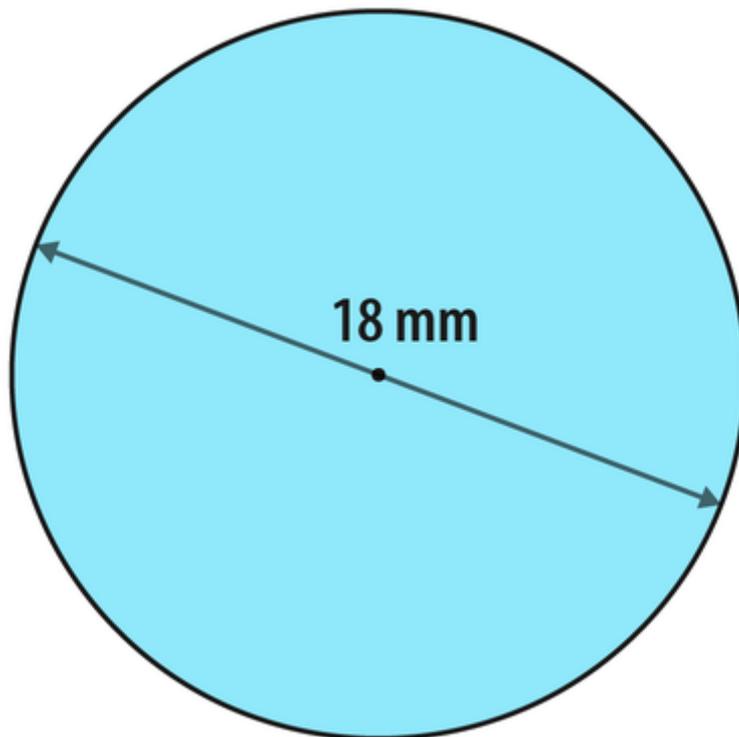


Finding the circumference of circles

U604

Work out the circumference of this circle.

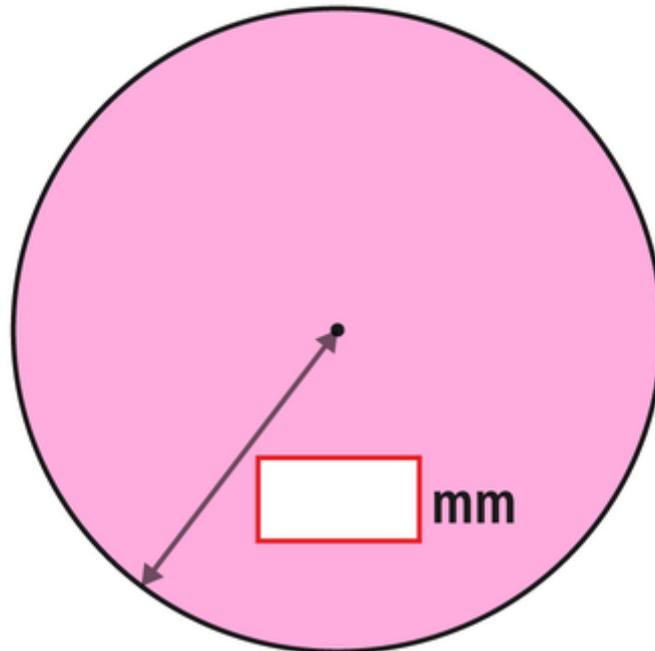
Give your answer in terms of π .



Not drawn accurately

Work out the radius of this circle.

$$\text{circumference} = 68\pi \text{ mm}$$



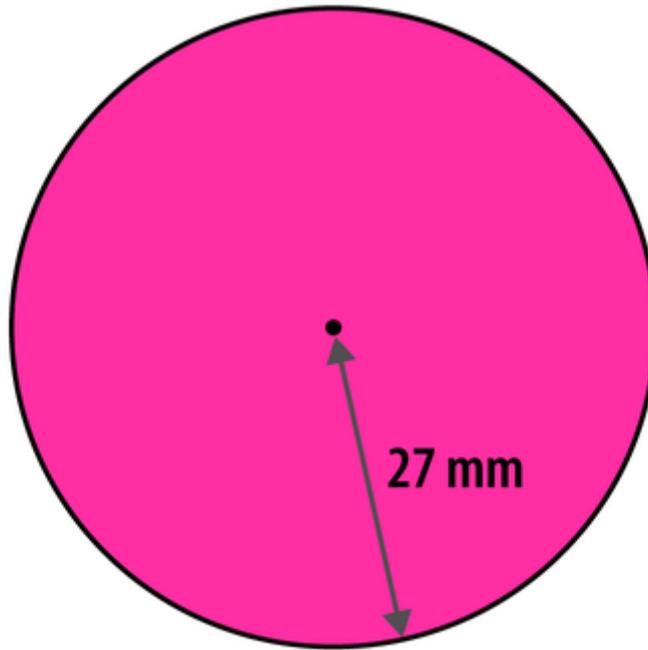
Not drawn accurately

Finding the area of circles

U950

The radius of the circle below is 27 mm.

Calculate the area of the circle.
Give your answer in mm^2 to 1 d.p.



area = mm^2

Not drawn accurately

A circle has a diameter of 18 mm.

Work out the area of this circle.

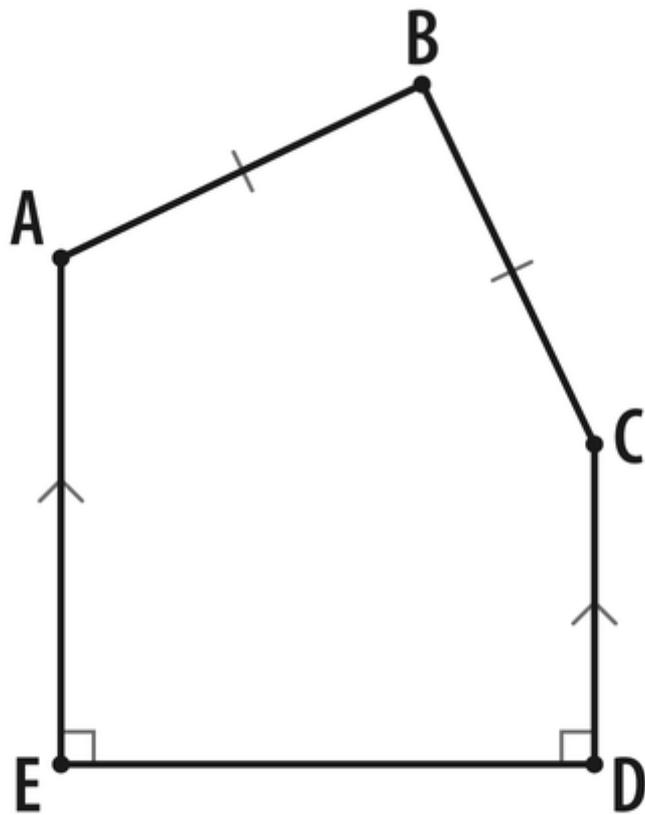
Give your answer in terms of π .

Shape - Parallel and perpendicular lines

Line and shape properties

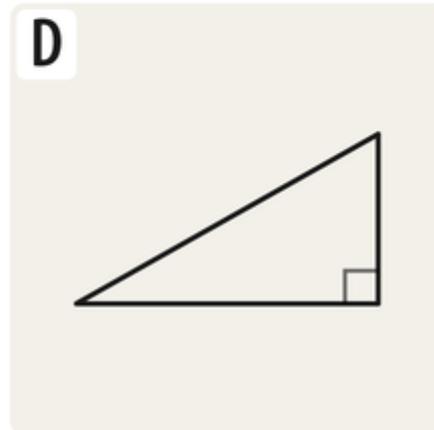
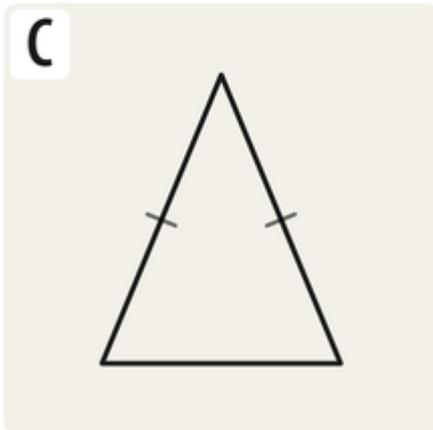
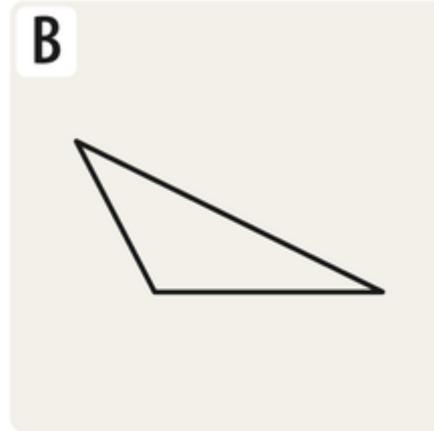
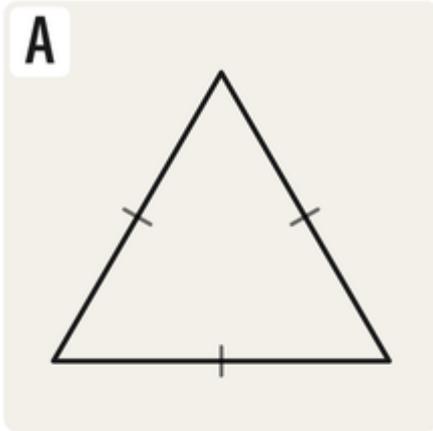
U121

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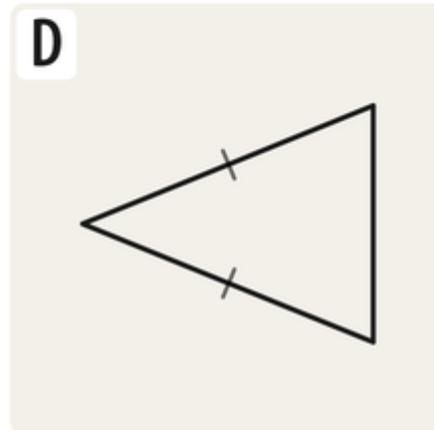
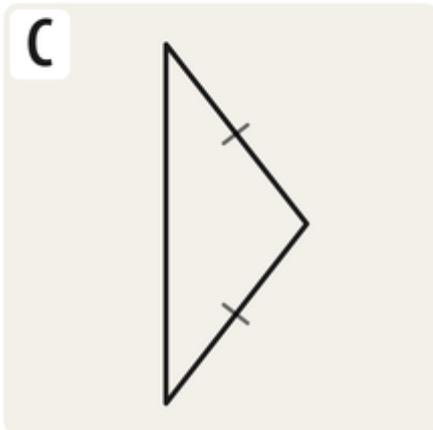
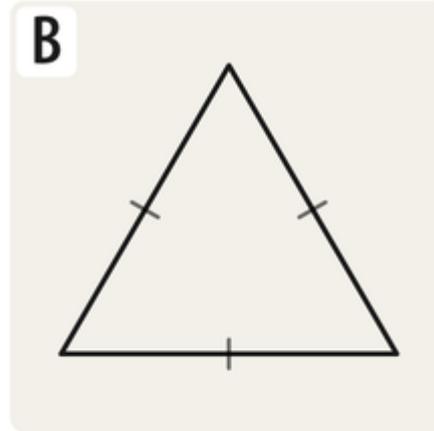


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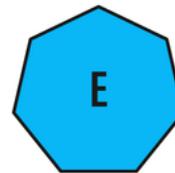
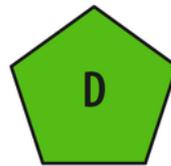
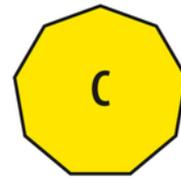
Pentagon

Nonagon

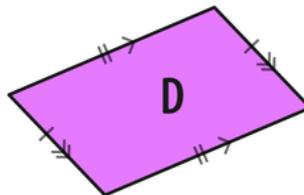
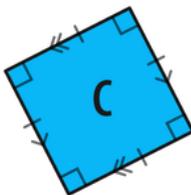
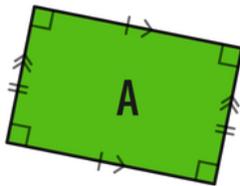
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Octagon

Heptagon



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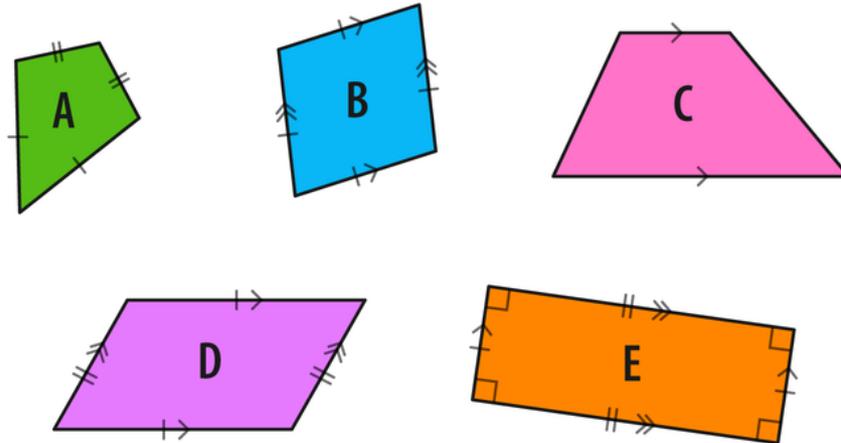
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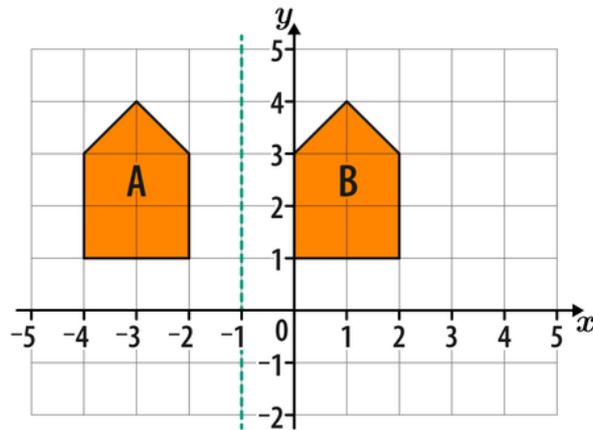
What is the mathematical name for this quadrilateral?

Shape - Reflection

Reflection

U799

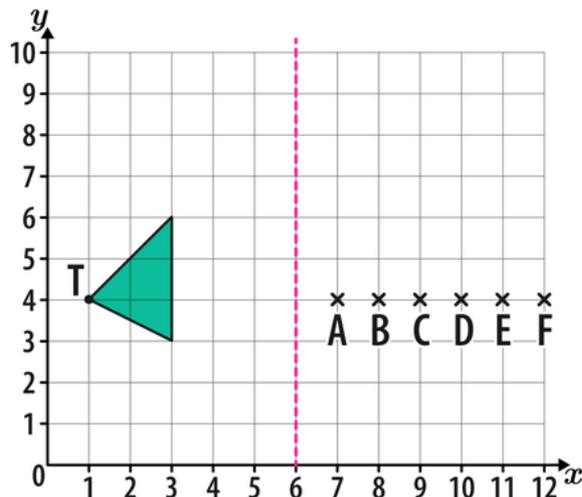
Copy and complete the sentence below.



Shape B is a reflection of shape A in the line with equation

The triangle shown below is reflected in the line $x = 6$.

Which letter marks the reflection of vertex T?

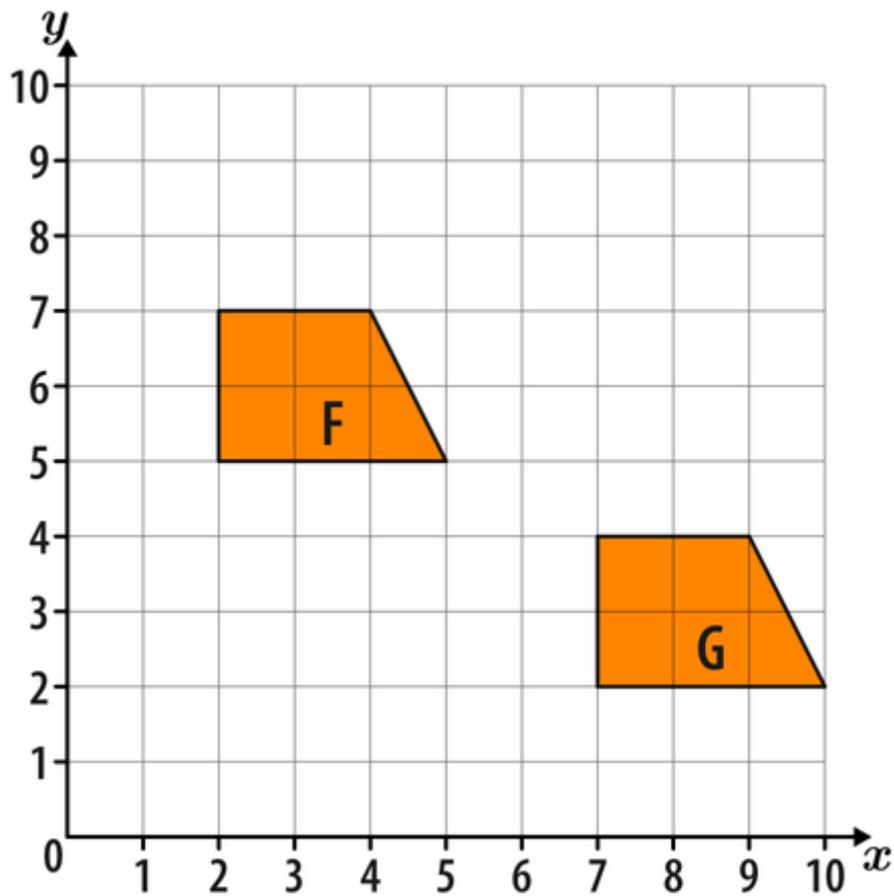


Shape - Transformations

Translation

U196

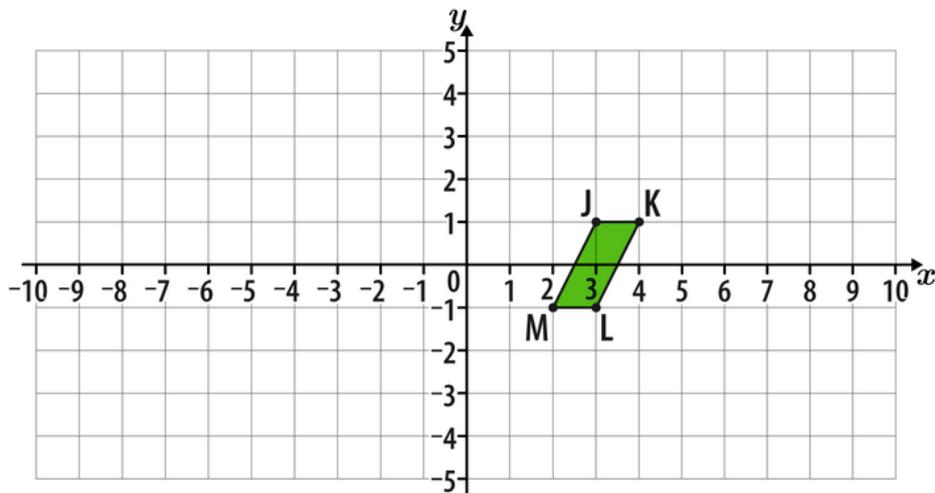
Describe the translation from shape F to shape G as a vector.



$J'K'L'M'$ is a translation of $JKLM$ by vector $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$.

a) What are the coordinates of K' ?

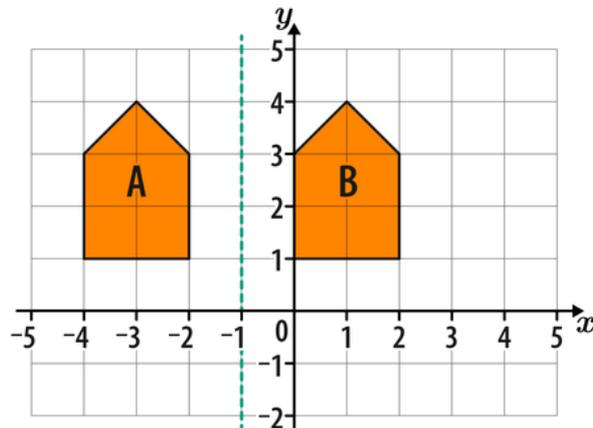
b) What are the coordinates of M' ?



Reflection

U799

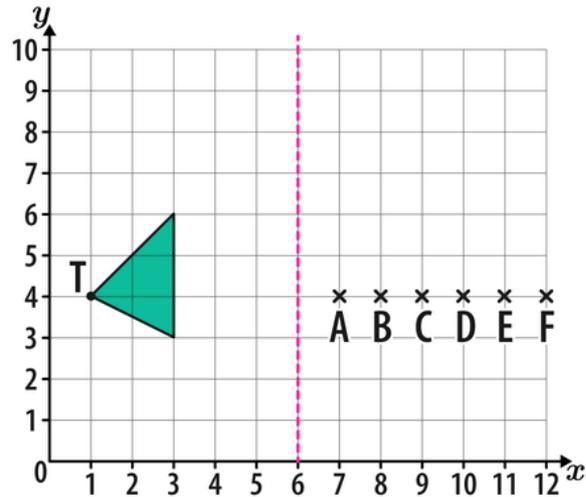
Copy and complete the sentence below.



Shape B is a reflection of shape A in the line with equation

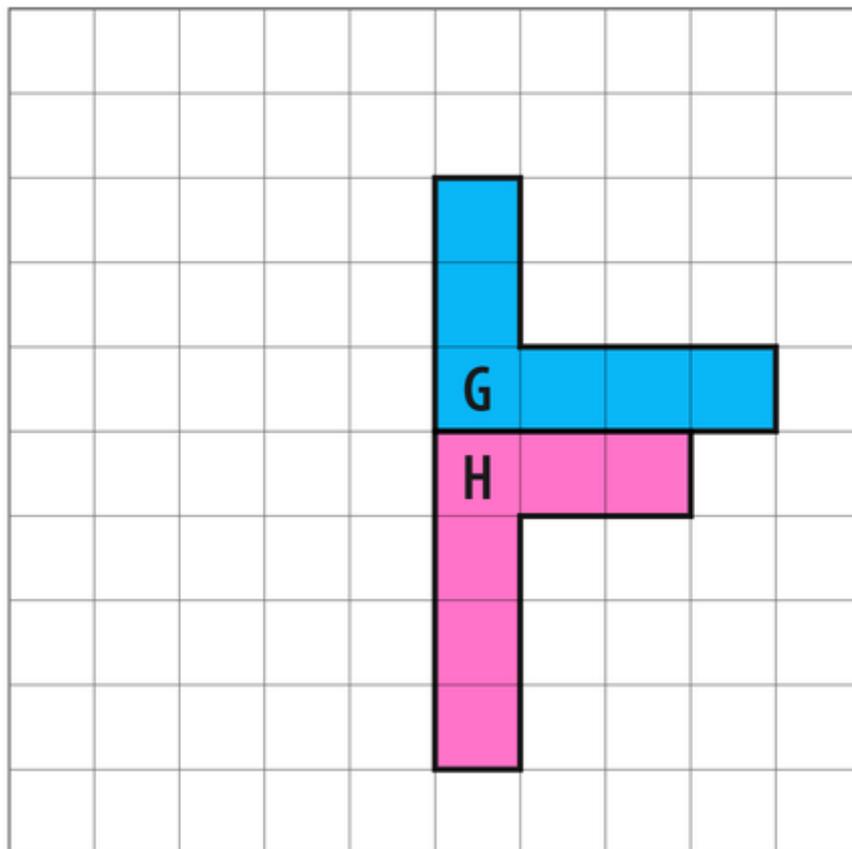
The triangle shown below is reflected in the line $x = 6$.

Which letter marks the reflection of vertex T?



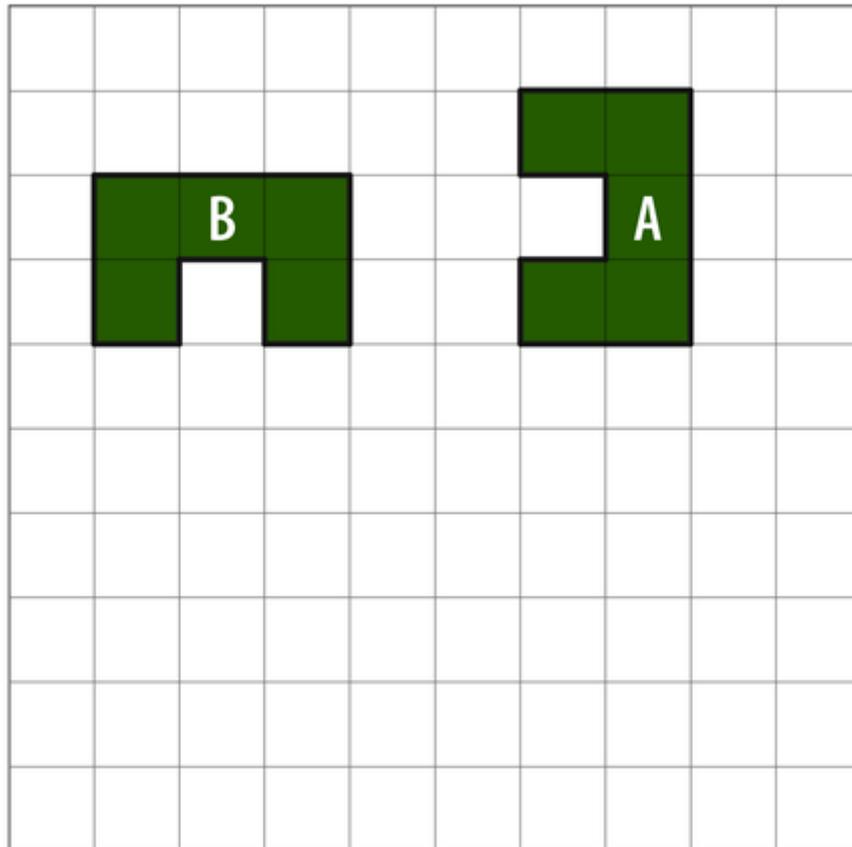
Shape G is rotated clockwise to get shape H.

What is the angle of rotation?



Shape A has been rotated through 90° to get to shape B.

In which direction has it been rotated?

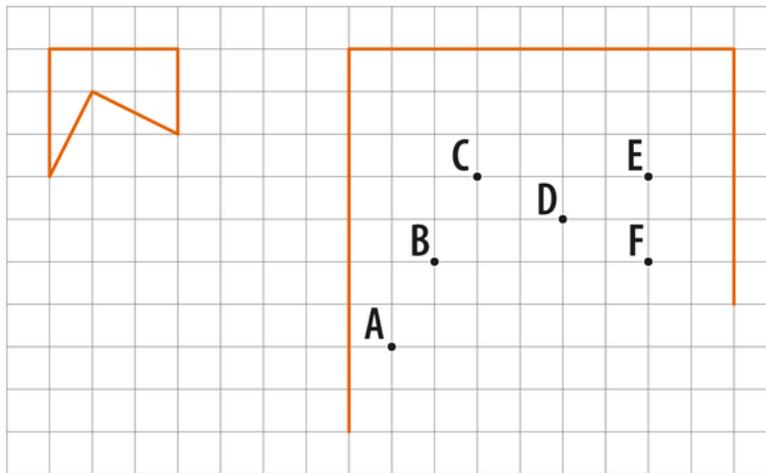


Enlargement by a positive scale factor

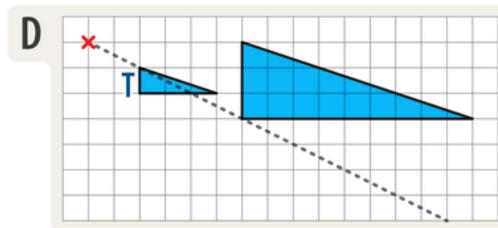
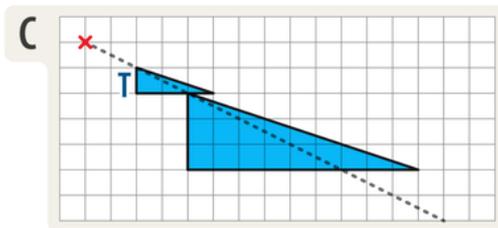
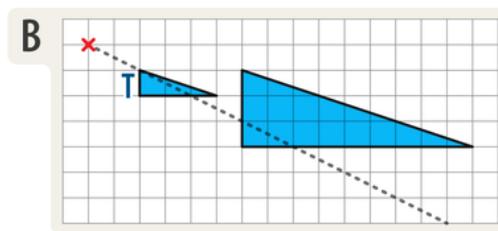
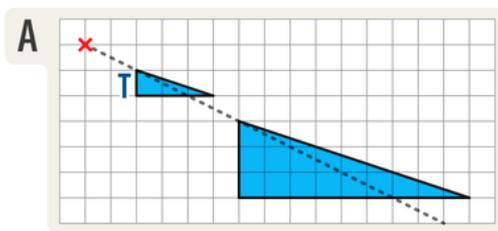
U519

The shape below is enlarged by a scale factor of 3.
Three sides of the enlargement are shown.

Which letter marks the position of the missing vertex?

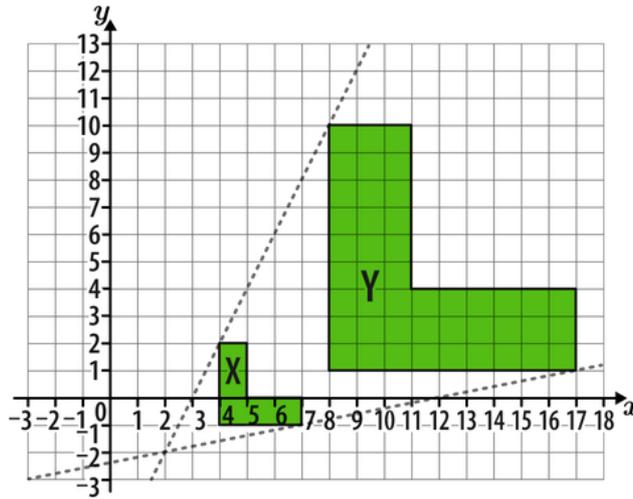


Which diagram shows an enlargement of triangle T with a scale factor of 3 and the centre of enlargement at the cross?

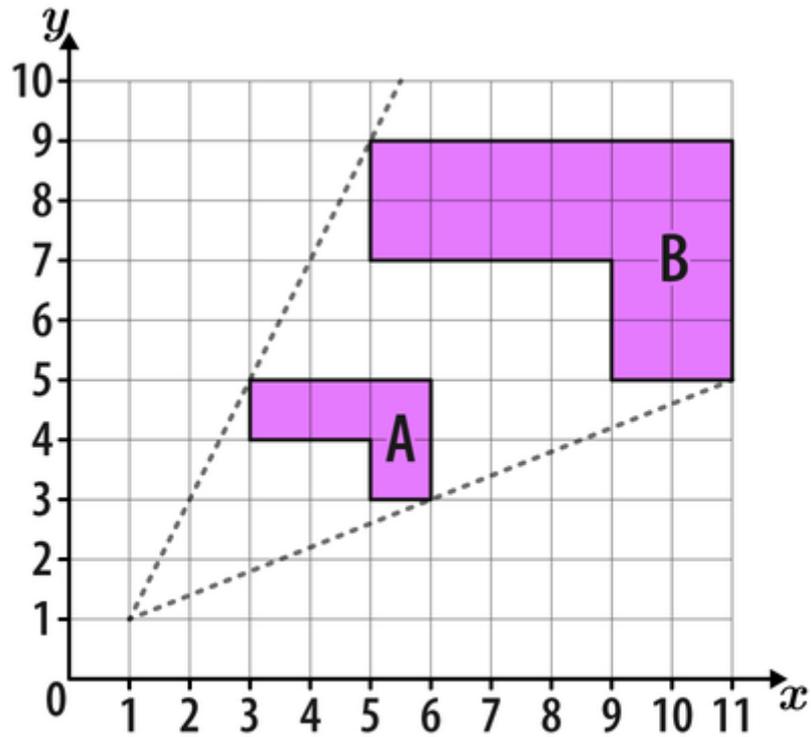


Shape Y is an enlargement of shape X with centre $(2, -2)$.

What is the scale factor of the enlargement?



Complete the sentence below to fully describe the enlargement of shape A to shape B.



Enlargement with a scale factor of
and centre (,)

Combining transformations

U766

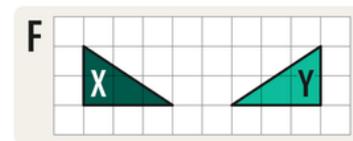
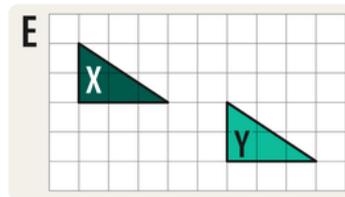
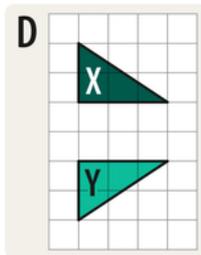
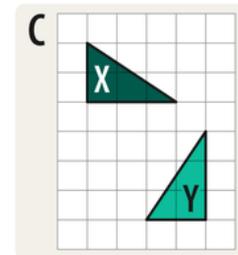
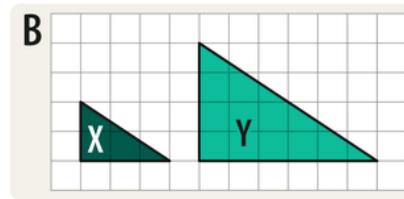
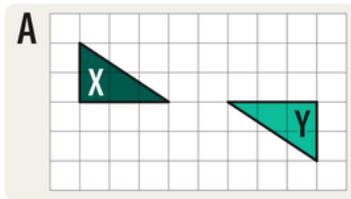
For each diagram below, select the type of transformation that maps triangle X onto triangle Y.

Enlargement

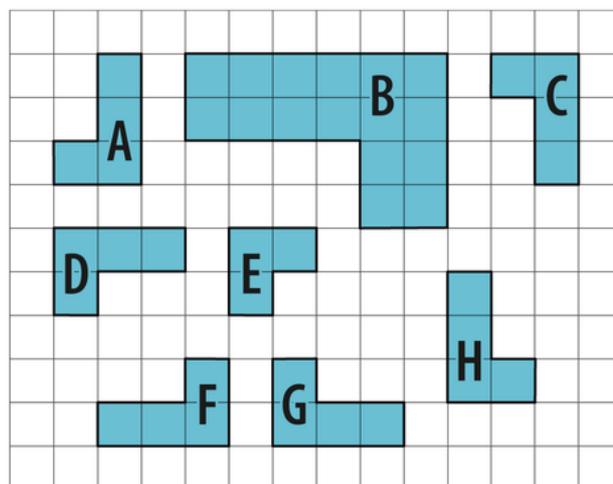
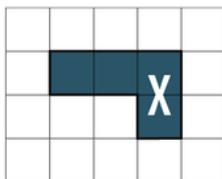
Reflection

Translation

Rotation



Select **all** of the shapes below which are **rotations** of shape X.



Shape - Plan and elevation

Plans and elevations

U743

The plan, front elevation and side elevation of a cuboid are drawn on the centimetre square grid below using the scale of 1 cm to 1 m.

What are the height, width and depth of the cuboid in metres?

Plan	
Front elevation	
Side elevation	

Which of the 3D shapes below is shown by the plan and elevations?

Plan	
Front elevation	
Side elevation	

A

B

C

D

E

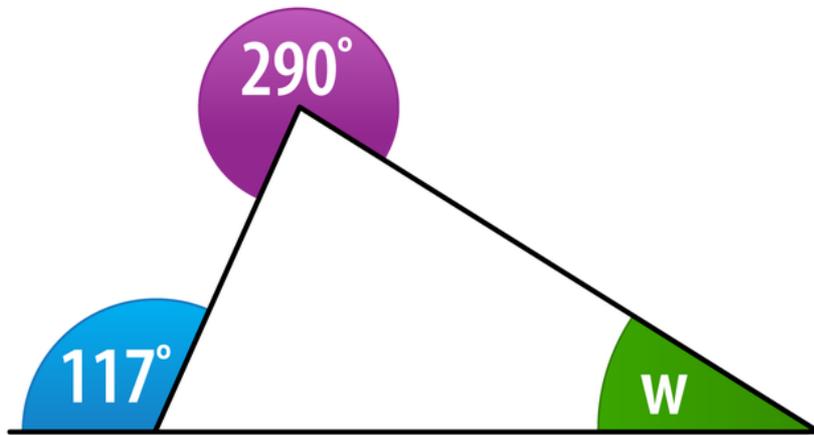
F

Angles - Angles in a triangle

Angles in triangles

U628

What is the size of angle w ? Give your answer in degrees ($^{\circ}$).



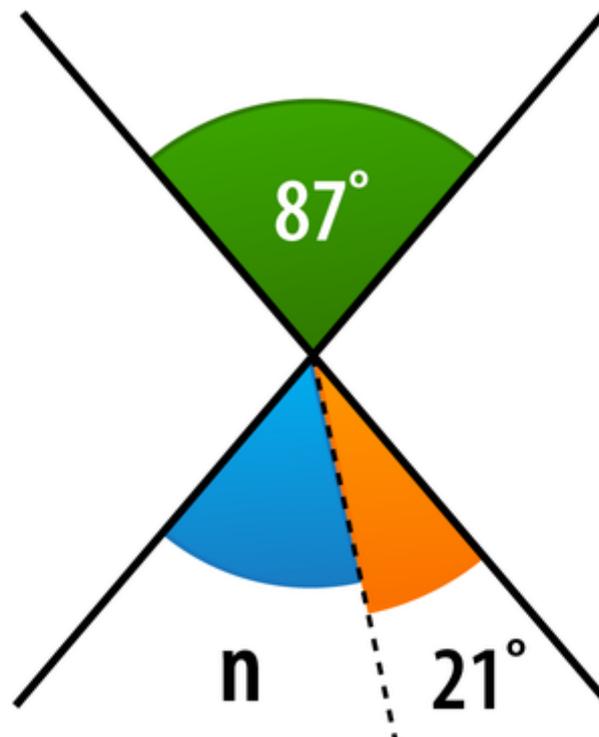
Not drawn accurately

Angles - Vertically opposite angles

Vertically opposite angles

U730

What is the size of angle n ?
Give your answer in degrees ($^{\circ}$).



Not drawn accurately

Angles - Angle properties of parallel lines

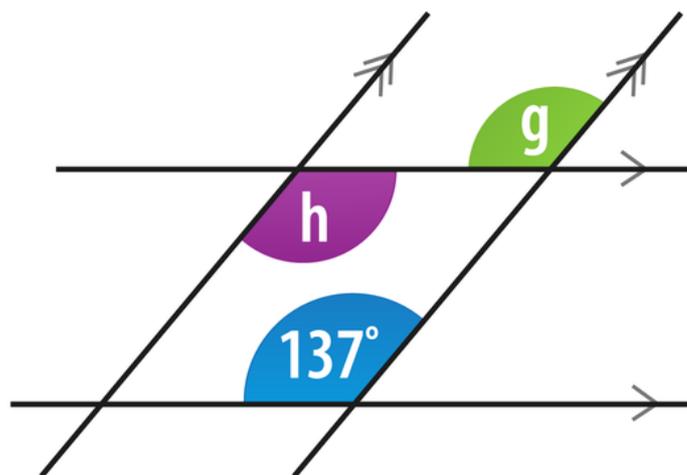
Angles on parallel lines

U826

Mohammed is trying to find angle h .

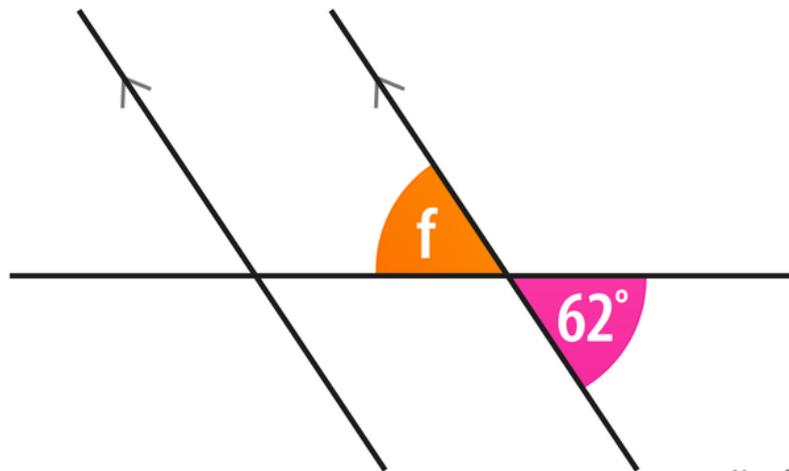
He finds angle g first and then he finds angle h from angle g .

- Which angle fact does he use to find angle g ?
- Which angle fact does he then use to find angle h ?



Not drawn accurately

Give the fact that connects the two angles labelled below.
Use this fact to find the value of f in degrees ($^{\circ}$).



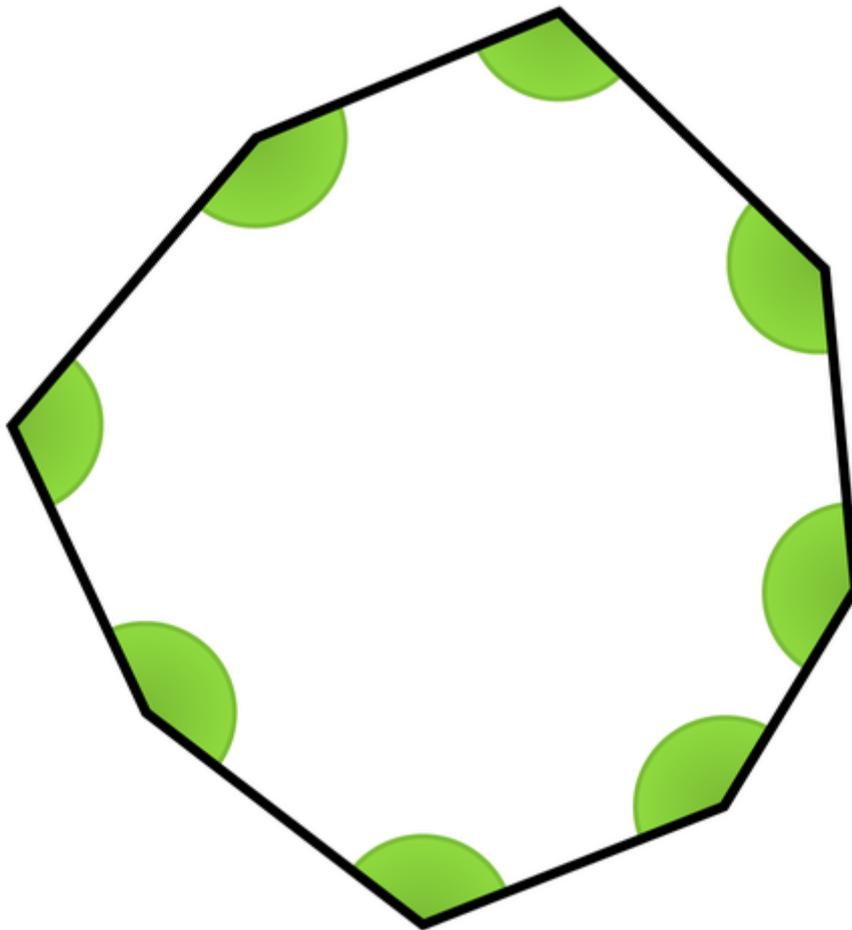
Not drawn accurately

Angles - Angles in a polygon

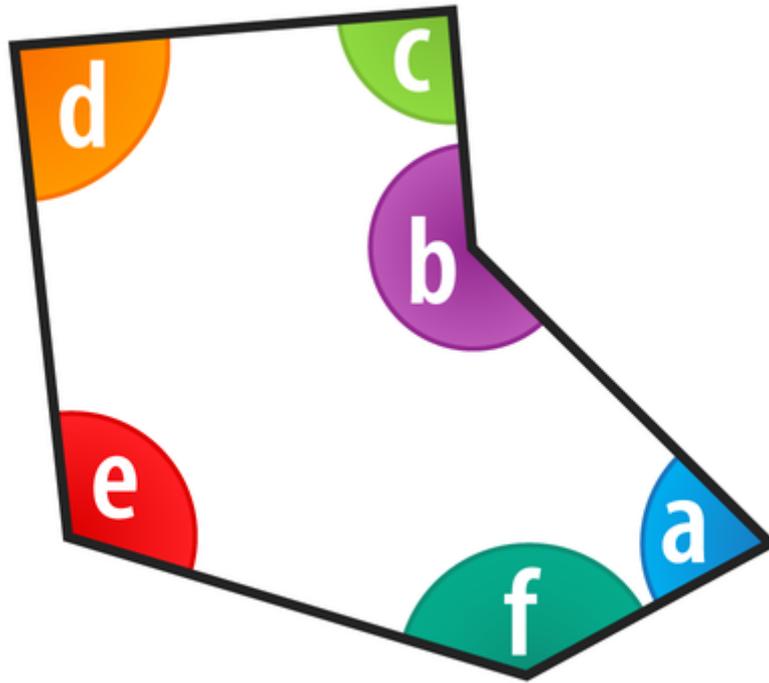
Angles in polygons

U427

What is the sum of the angles marked in this shape?

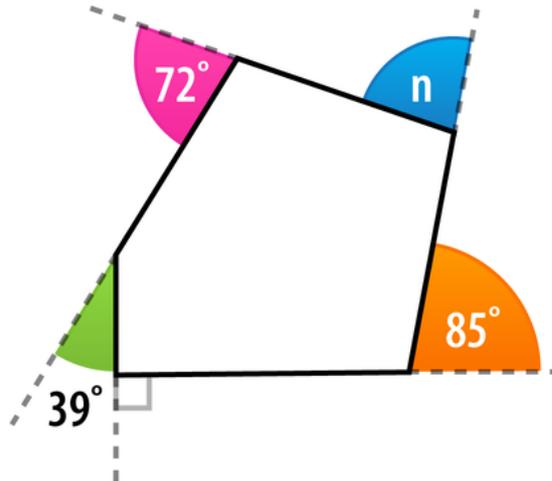


If $a + b + c + d + e = 576^\circ$, find the value of angle f . Give your answer in degrees ($^\circ$).



Not drawn accurately

An irregular pentagon is shown below.
Calculate the size of the angle marked n .
Give your answer in degrees ($^{\circ}$).

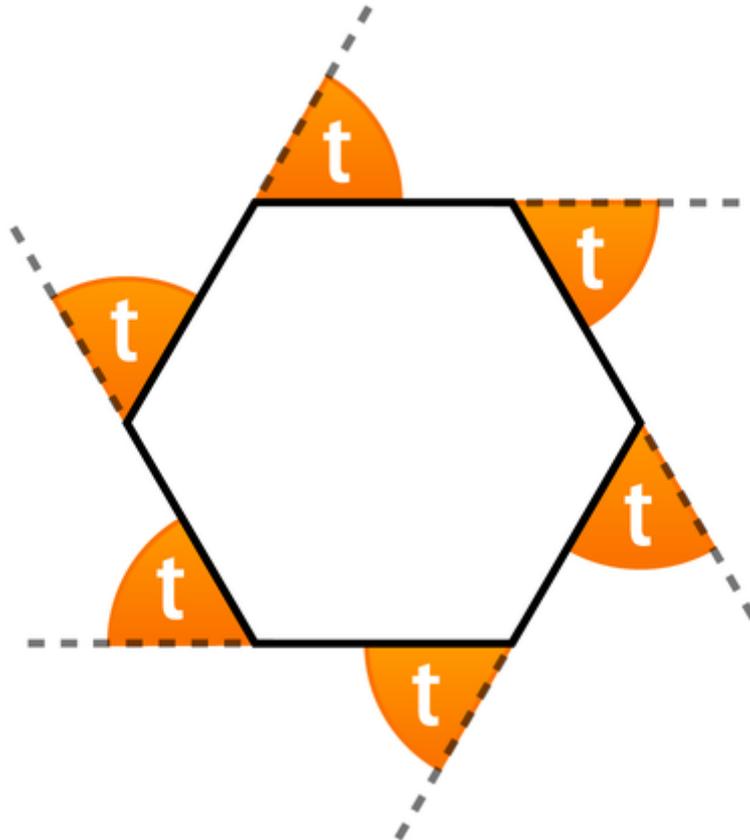


Not drawn accurately

In this regular hexagon, all of the exterior angles marked t are the same size.

Find the value of t .

Give your answer in degrees ($^{\circ}$).



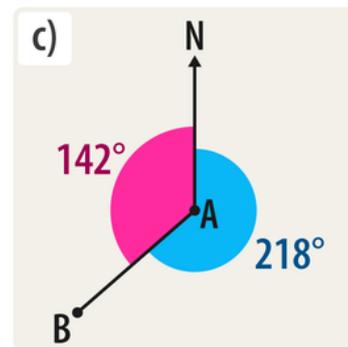
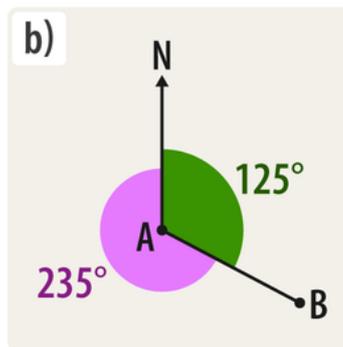
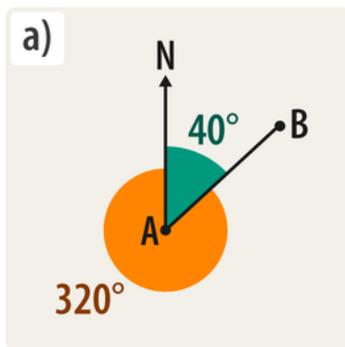
Angles - Bearings

Measuring and drawing bearings

U525

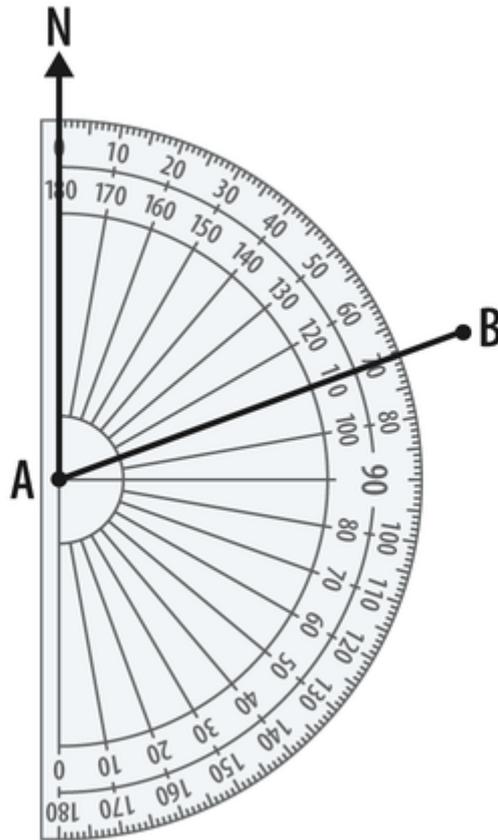
For each of the examples below, identify the bearing of **B** from **A**.

(Hint: bearings are written with three digits.)

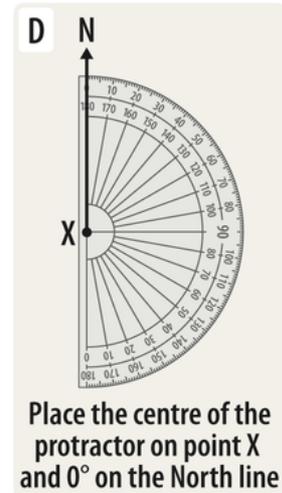
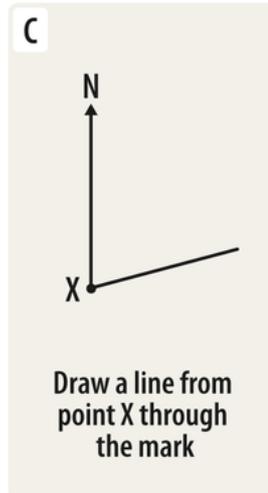
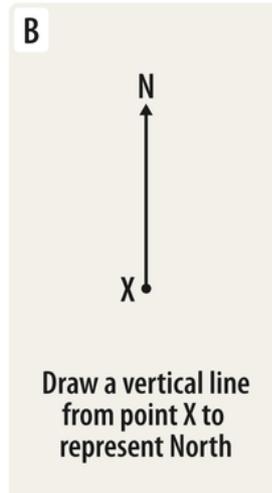
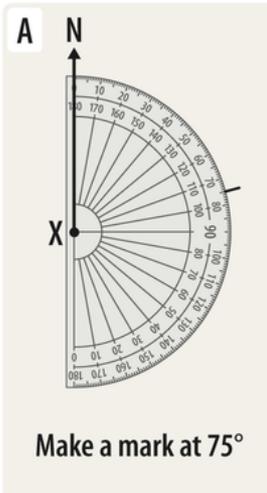


Not drawn accurately

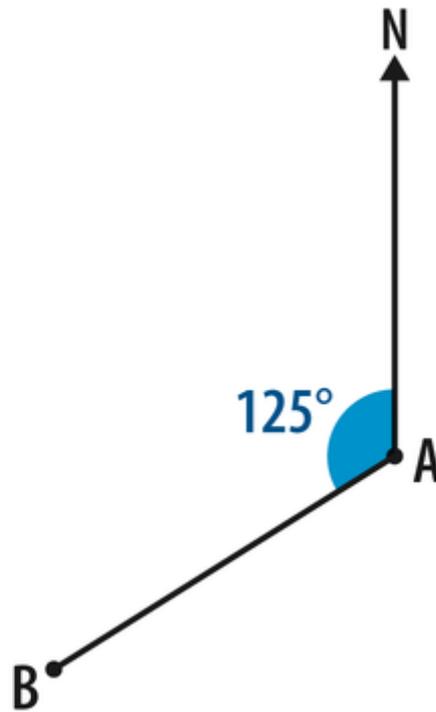
Work out the bearing of B from A.



The steps for drawing a bearing of 075° from a point, X, are shown below.
Put the steps in the correct order.

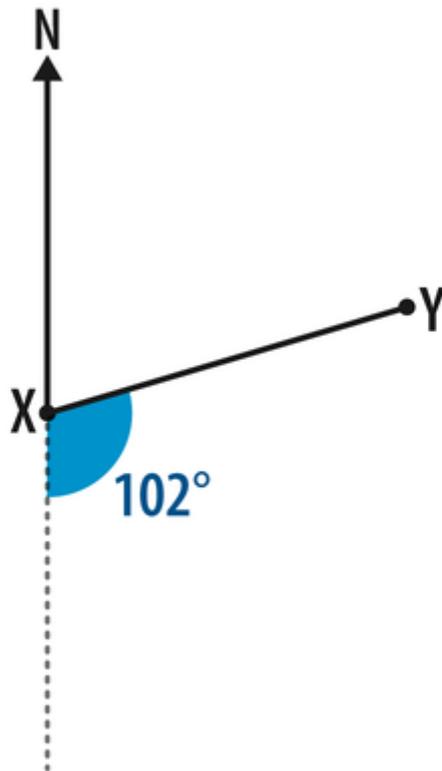


Work out the bearing of B from A.



Not drawn accurately

Calculate the bearing of Y from X.



Not drawn accurately

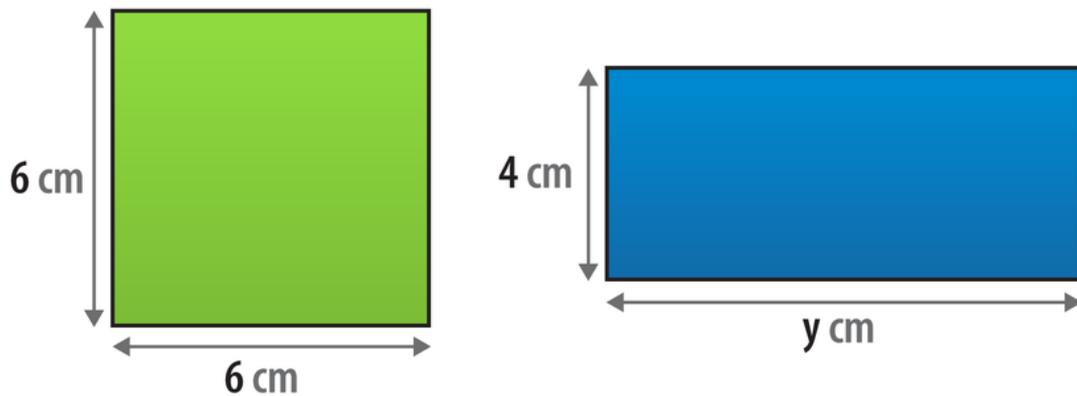
Length, area, and volume - Area of a rectangle

Mixed problems: Finding the area and perimeter of rectangles

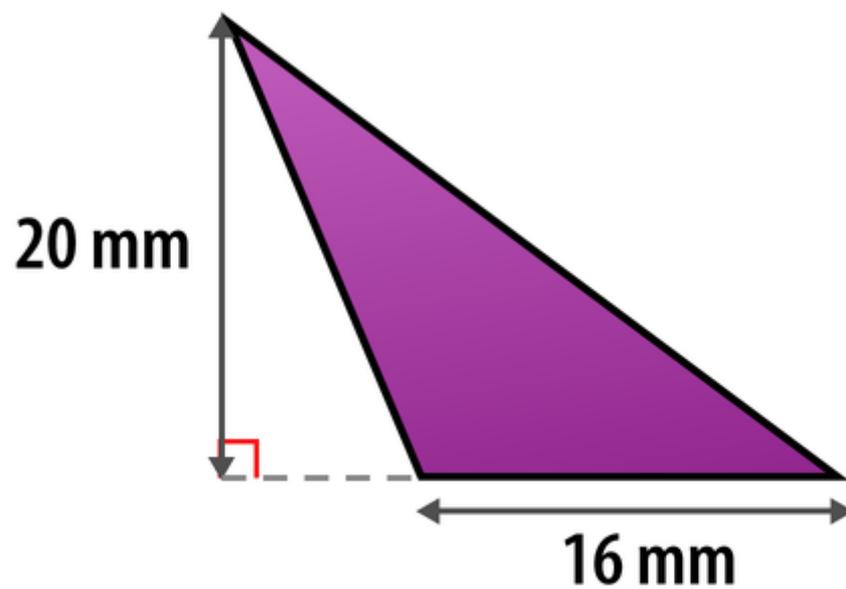
U993

This square and rectangle have the **same area**.

Work out the value of y .

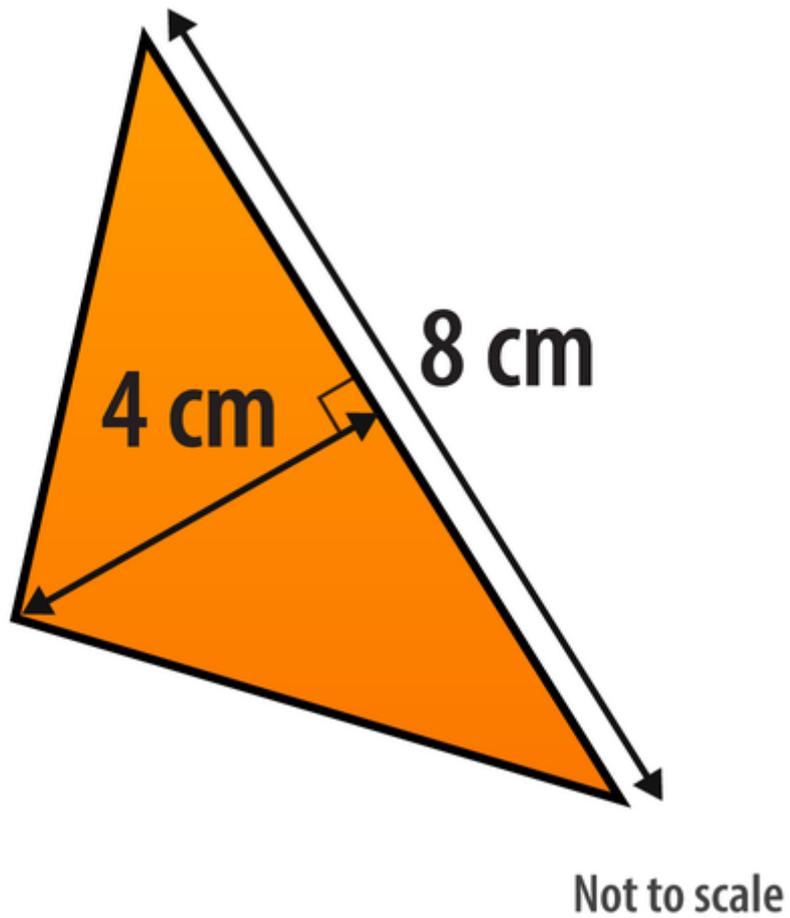


Not drawn accurately

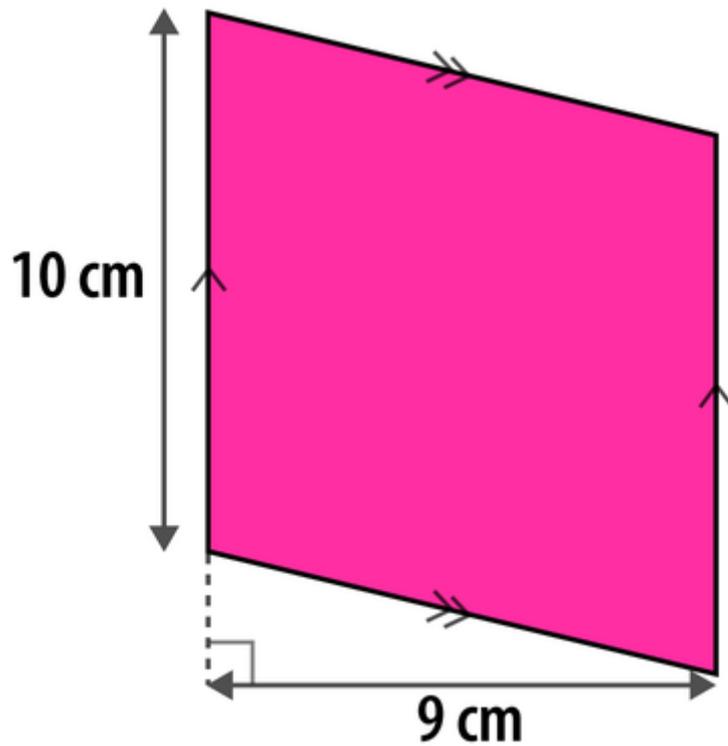
Length, area, and volume - Area of a triangle**Finding the area of triangles****U945**What is the **area** of the triangle below?**Not to scale**

Problem solving: Area of triangles, parallelograms and trapeziums (Foundation) U343

Work out the area of this triangle.

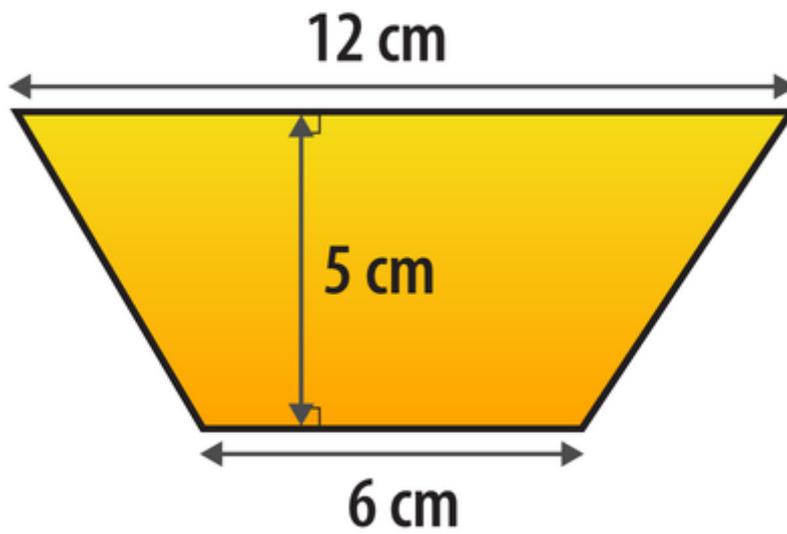


Work out the **area** of this parallelogram.



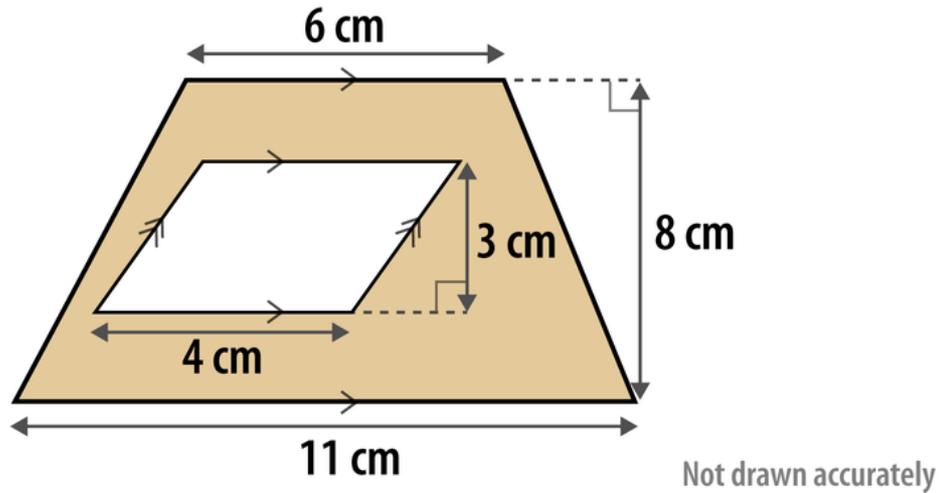
Not drawn accurately

Calculate the area of the trapezium.



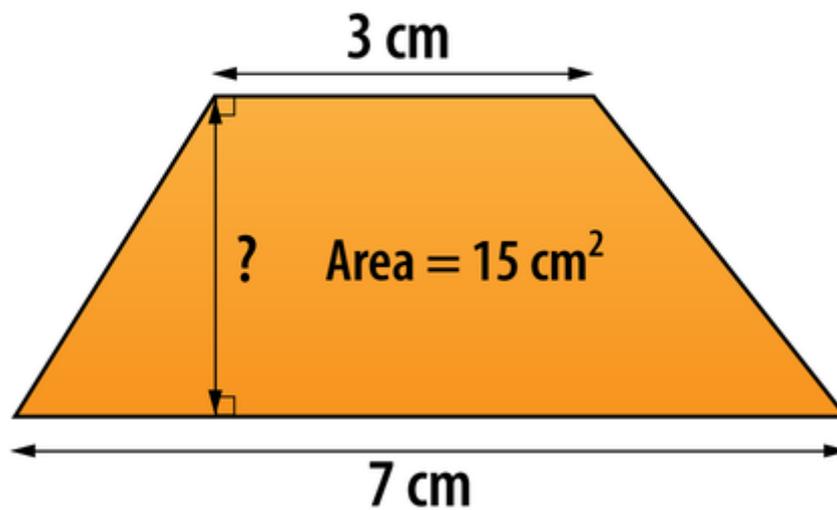
Not to scale

Calculate the **area** of the shaded section of this shape.



$$\text{Area of a trapezium} = \frac{\text{sum of parallel sides}}{2} \times \text{height}$$

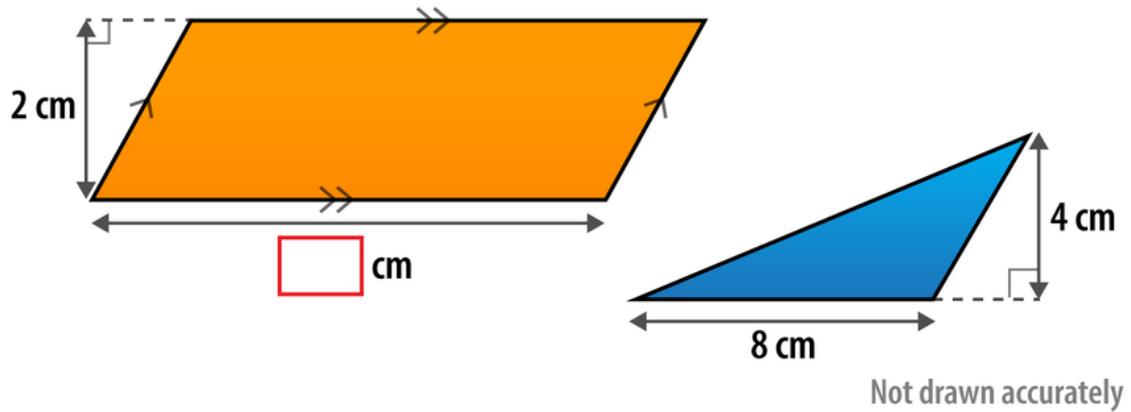
What is the height of this trapezium?



Not to scale

The parallelogram and the triangle below have the **same area**.

What number should go in the box?



Length, area, and volume - Area of a trapezium

Finding the area of trapeziums

U265

What is the **area** of the trapezium?

20 cm

9 cm

12 cm

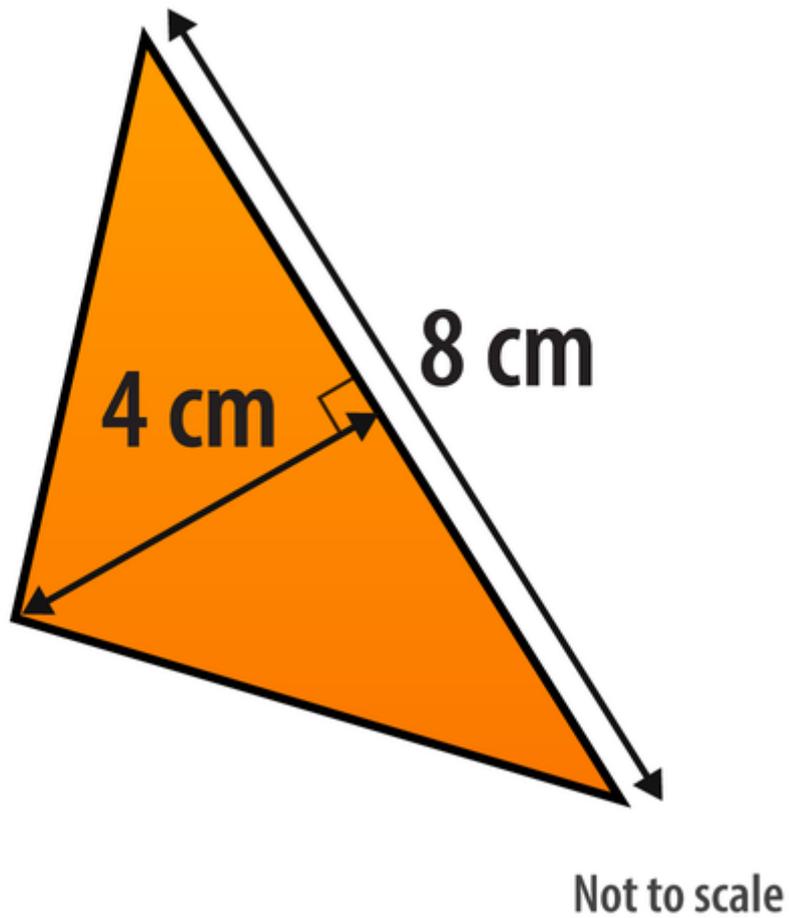
13 cm

30 cm

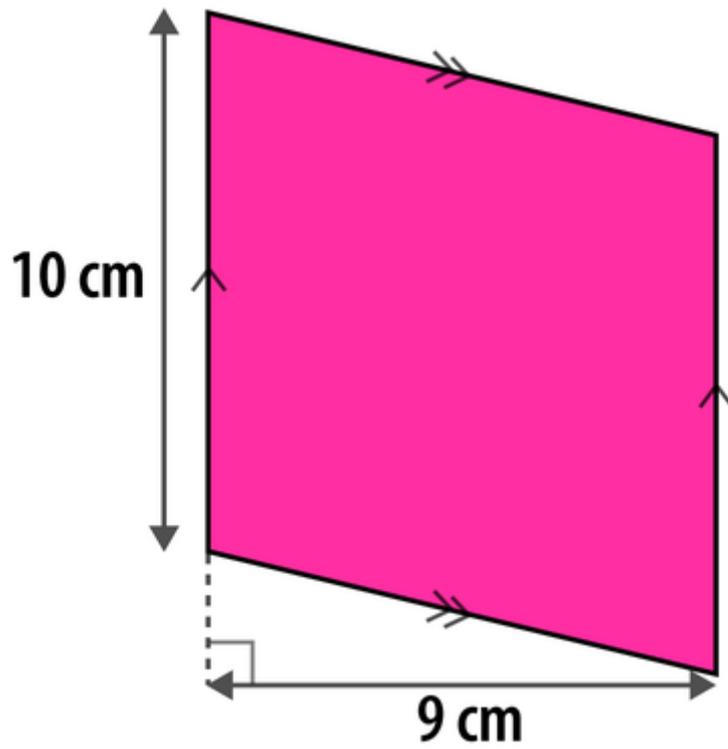
Not drawn accurately

Problem solving: Area of triangles, parallelograms and trapeziums (Foundation) U343

Work out the area of this triangle.

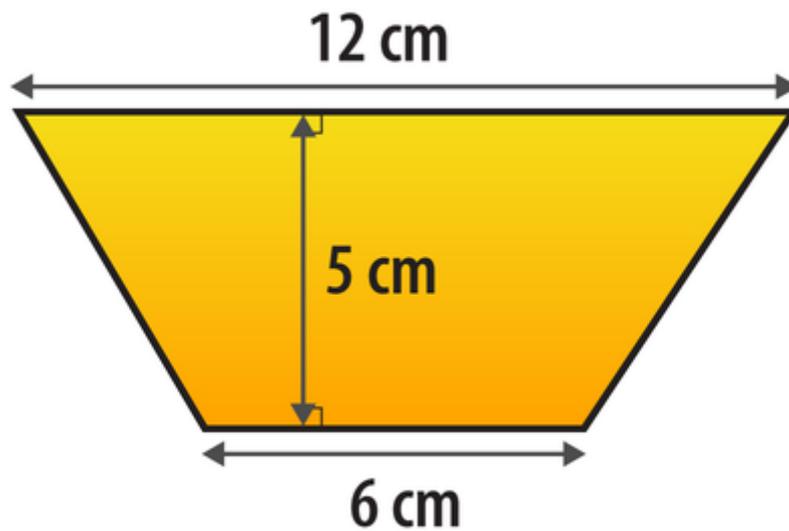


Work out the **area** of this parallelogram.



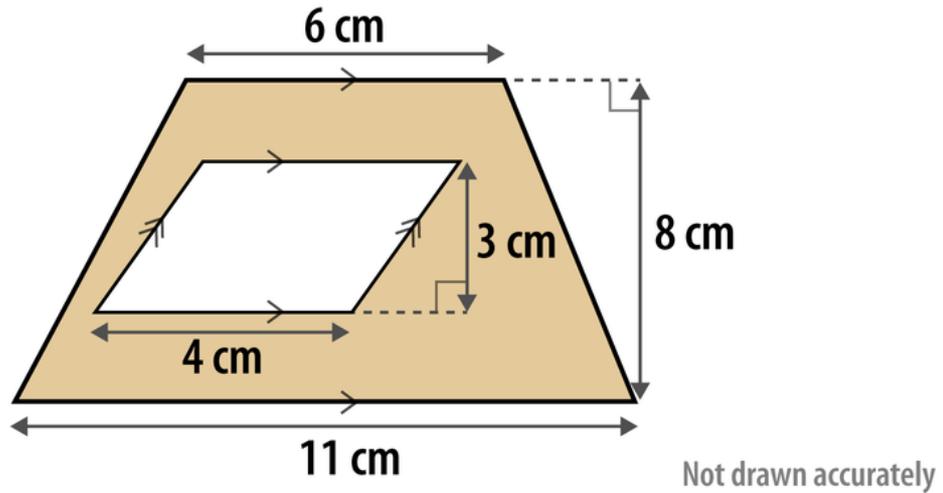
Not drawn accurately

Calculate the area of the trapezium.



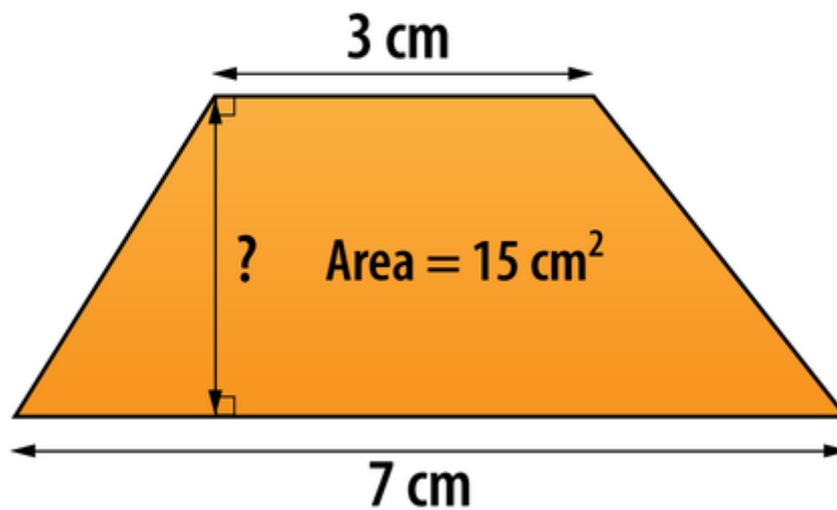
Not to scale

Calculate the **area** of the shaded section of this shape.



$$\text{Area of a trapezium} = \frac{\text{sum of parallel sides}}{2} \times \text{height}$$

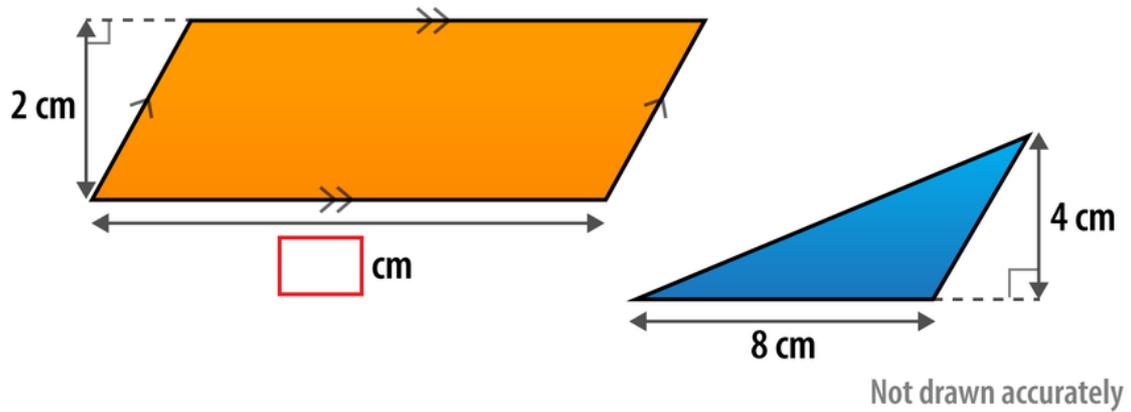
What is the height of this trapezium?



Not to scale

The parallelogram and the triangle below have the **same area**.

What number should go in the box?



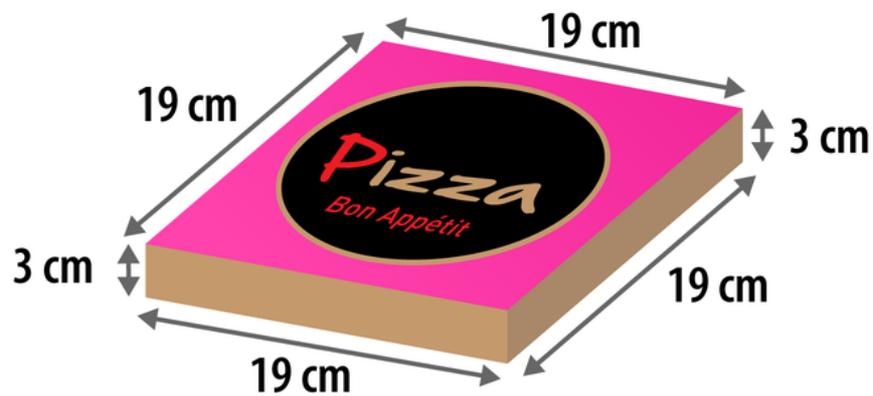
Length, area, and volume - Volume of a cube

Finding the volume of cubes and cuboids

U786

The pizza box below is a cuboid. Calculate its **volume**.

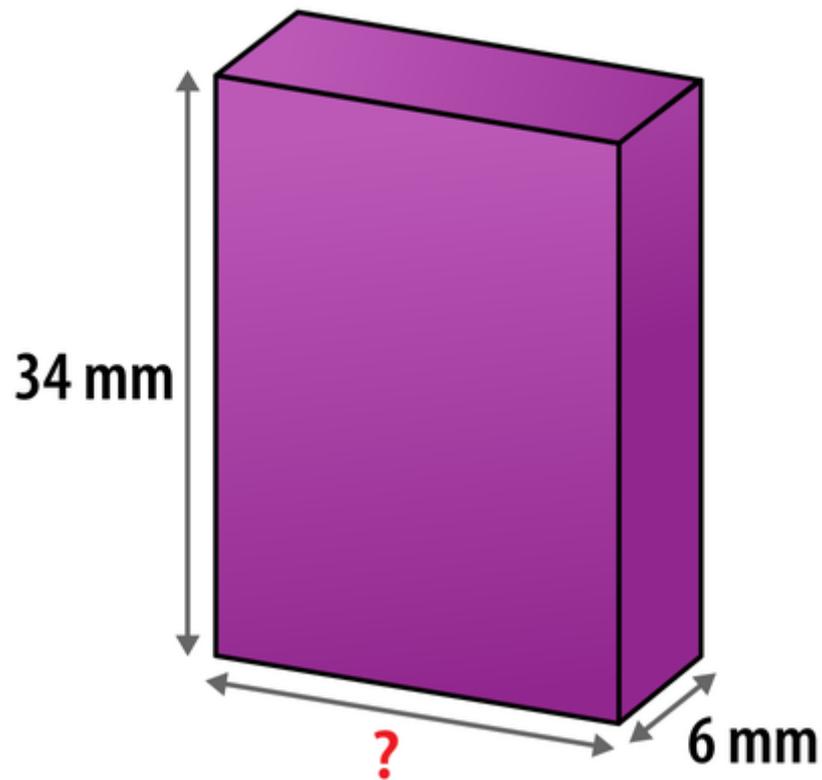
Remember to give the correct units.



Not drawn accurately

The cuboid below has a height of **34 mm** and a width of **6 mm**. It has a volume of **3468 mm^3** .

What is the **length** of the cuboid?
Remember to give the correct units, and give any decimal answers to 1 d.p.



Not drawn accurately

Length, area, and volume - Volume of a cylinder

Finding the volume of cylinders

U915

Work out the volume of the cylindrical tin of paint below.

Give your answer in terms of π .



Not drawn accurately

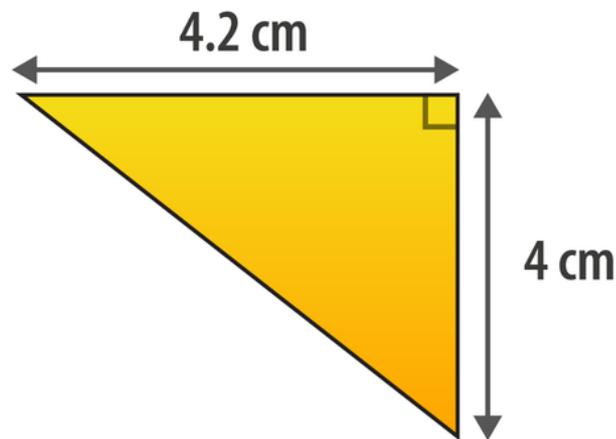
Pythagoras's Theorem and Trigonometry - Pythagoras's Theorem

Using Pythagoras' theorem in 2D

U385

Using Pythagoras' theorem, calculate the length of the **hypotenuse** in this right-angled triangle.

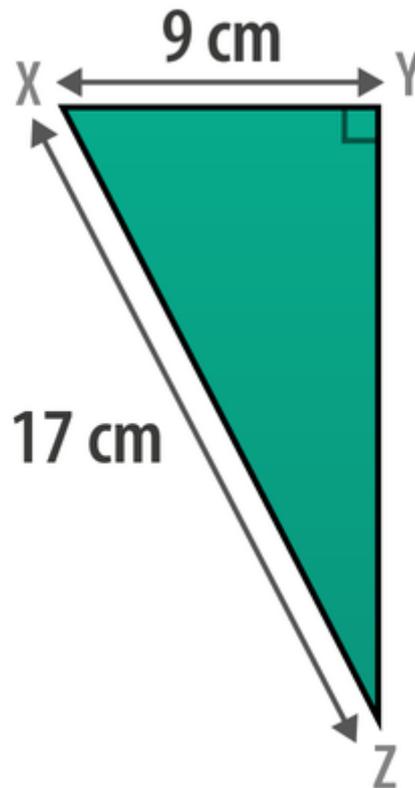
Give your answer in centimetres (cm) to 1 d.p.



Not drawn accurately

Using Pythagoras' theorem, calculate the length of YZ .

Give your answer in centimetres (cm) to 1 d.p.

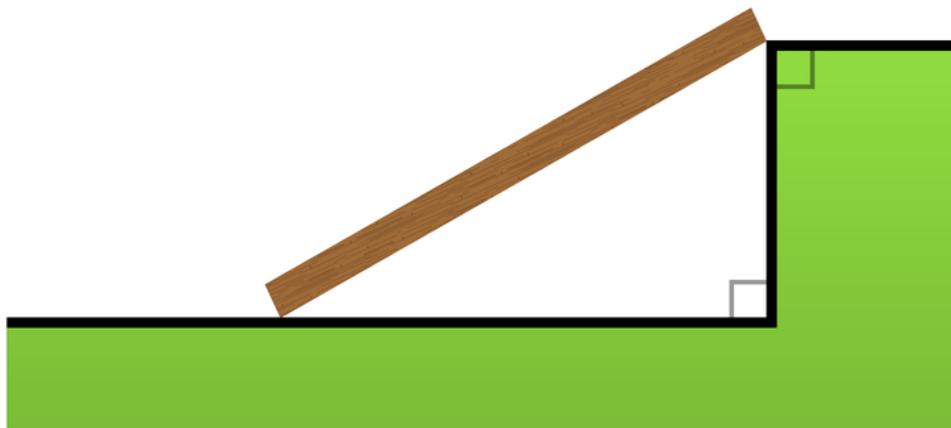


Not drawn accurately

Anaya has a rectangular plank of wood that is **32 inches** long. She creates a ramp by resting the plank against a wall with a height of **15 inches**, as shown.

Using Pythagoras' theorem, work out the horizontal distance between the wall and the bottom of the ramp.

Give your answer in inches to 1 d.p.



Not drawn accurately

Pythagoras's Theorem and Trigonometry - Exact trigonometric values

Using the exact values of trigonometric ratios

U627

Copy and complete each of the equalities below using the options given.

a) $\cos 30^\circ =$ $\frac{\sqrt{3}}{2}$ $\frac{1}{2}$ $\frac{1}{\sqrt{2}}$

b) $\cos 45^\circ =$ $\frac{\sqrt{3}}{2}$ $\frac{1}{2}$ $\frac{1}{\sqrt{2}}$

c) $\cos 60^\circ =$ $\frac{\sqrt{3}}{2}$ $\frac{1}{2}$ $\frac{1}{\sqrt{2}}$

Copy and complete each of the equalities below using the options given.

a) $\cos^{-1}\left(\frac{1}{2}\right) =$ 30° 45° 60°

b) $\sin^{-1}\left(\frac{1}{\sqrt{2}}\right) =$ 30° 45° 60°

c) $\tan^{-1}(\sqrt{3}) =$ 30° 45° 60°