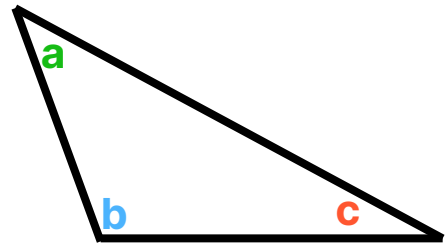


Key Rules:

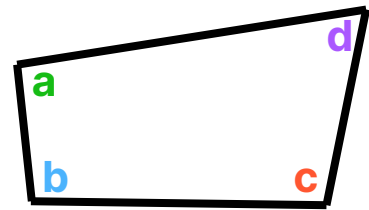
- Angles in a triangle add up to 180 degrees

$$a + b + c = 180$$



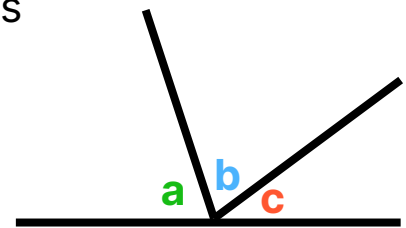
- Angles in a quadrilateral add up to 360 degrees

$$a + b + c + d = 360$$



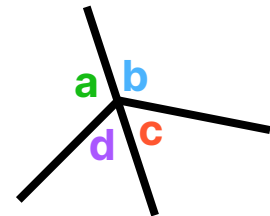
- Angles on a straight line add up to 180 degrees

$$a + b + c = 180$$

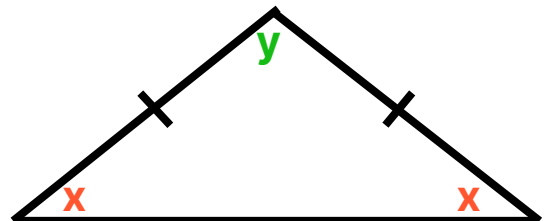


- Angles around a point add up to 360 degrees

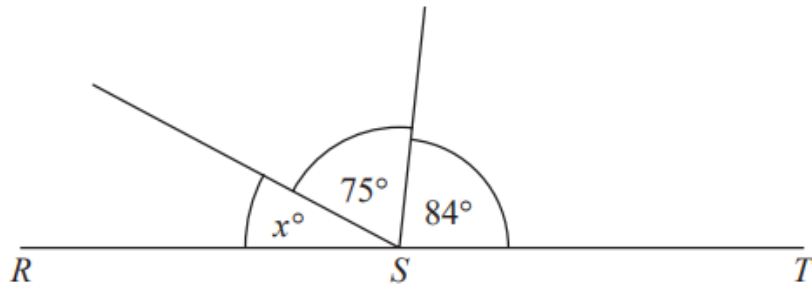
$$a + b + c + d = 360$$



- Two sides and two angles of an isosceles triangle are the same



Questions:

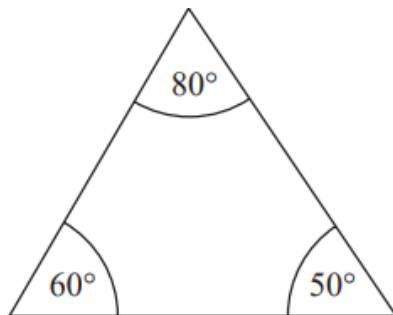


RST is a straight line.

Work out the value of x .

Give a reason for your answer.

The diagram below shows a triangle.

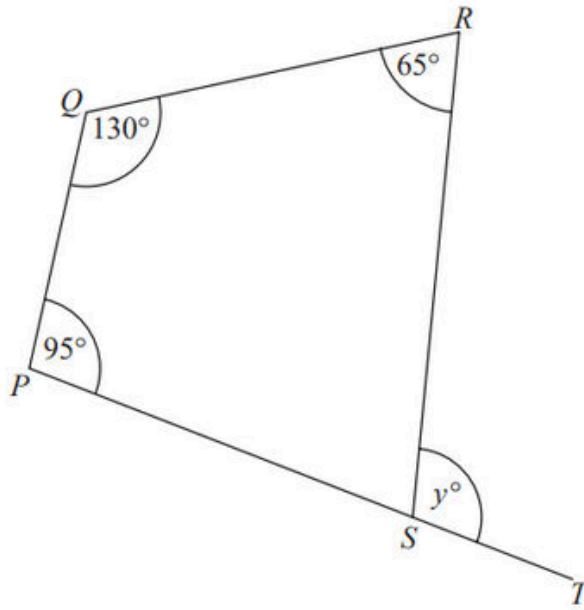


Explain why the diagram is wrong.

Geometry - Class 9

PQRS is a quadrilateral.

PST is a straight line.



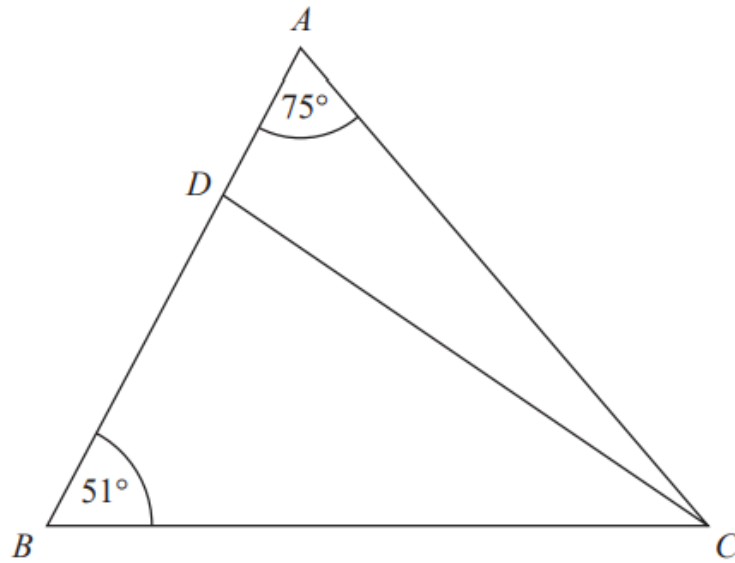
Find the value of y

The diagram shows triangle ABC.

ABD is a straight line.

the size of angle DCB : the size of angle ACD = 2 : 1

Work out the size of angle BDC.

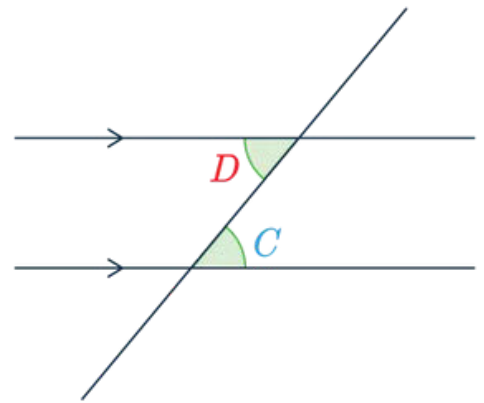


Parallel Lines and Angles

Alternate Angles

$$D = C$$

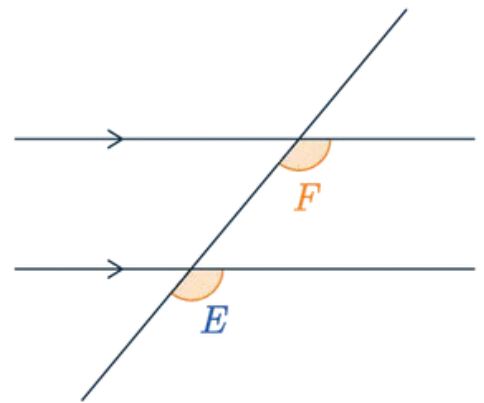
They are found in a 'Z' shape and are sometimes called Z angles.



Corresponding Angles

$$F = E$$

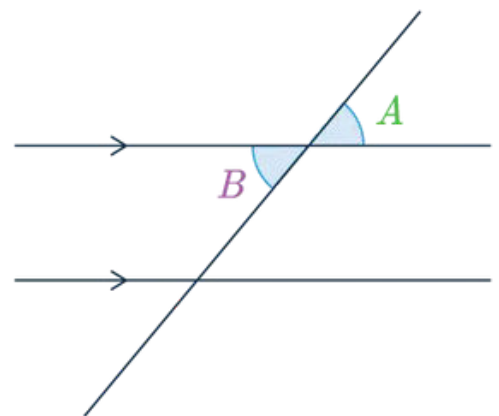
They are found in a 'F' shape and are sometimes called F angles.



Vertically Aligned Angles

$$B = A$$

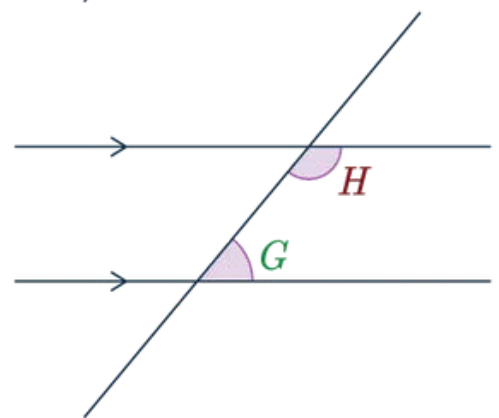
They are found vertically opposite each other.



Interior/Allied Angles

$$H + G = 180$$

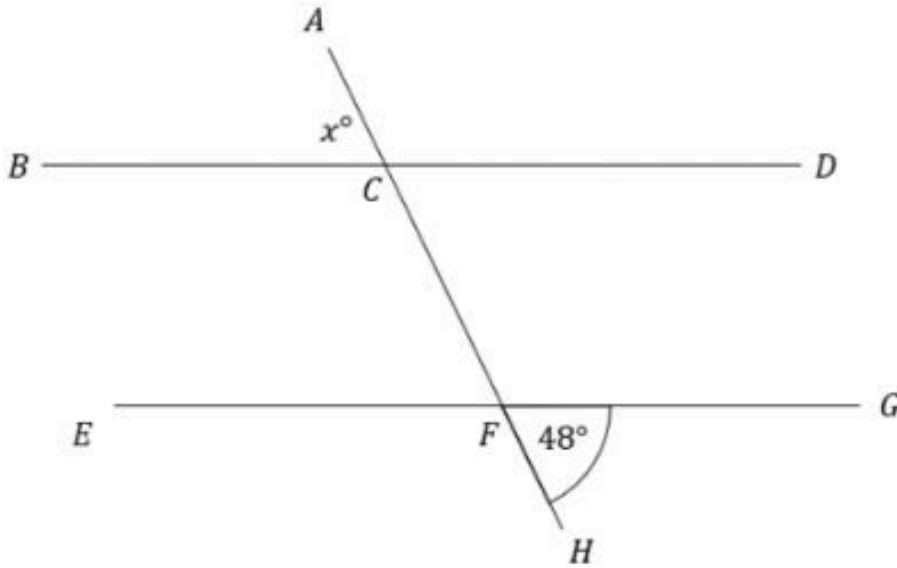
They are found in a 'C' shape and can be referred to as either allied or interior angles



Questions:

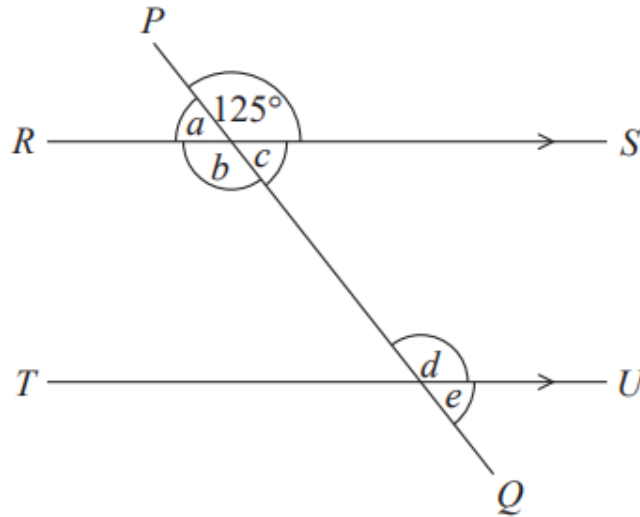
BD and EG are parallel lines. Find the angle marked x in the picture below.

Give a reason for each stage of your working.



RS and TU are parallel lines.

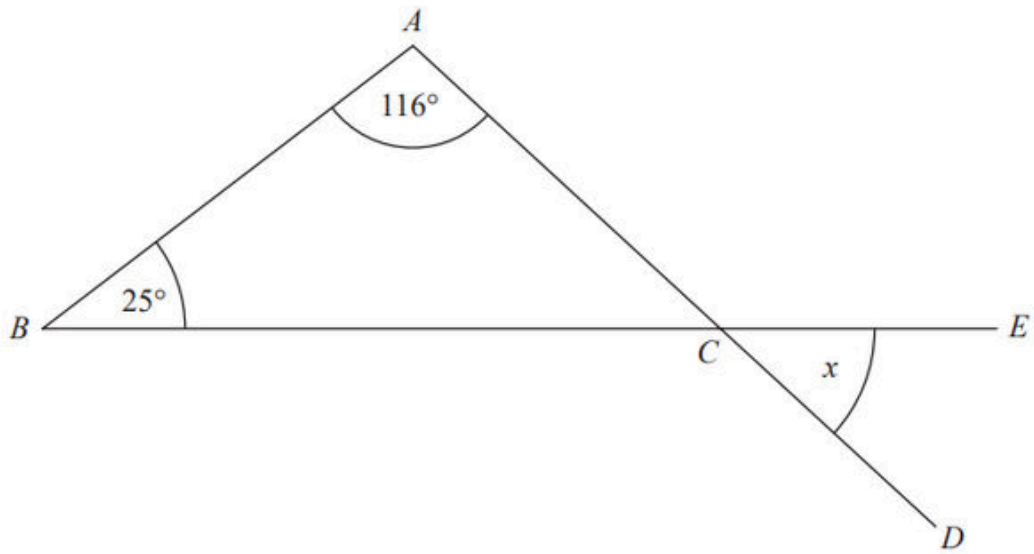
PQ is a straight line.



Write down the letter of one other angle of size 125 degrees

Explain why $a + b + c = 235$ degrees

The diagram shows a triangle ABC.

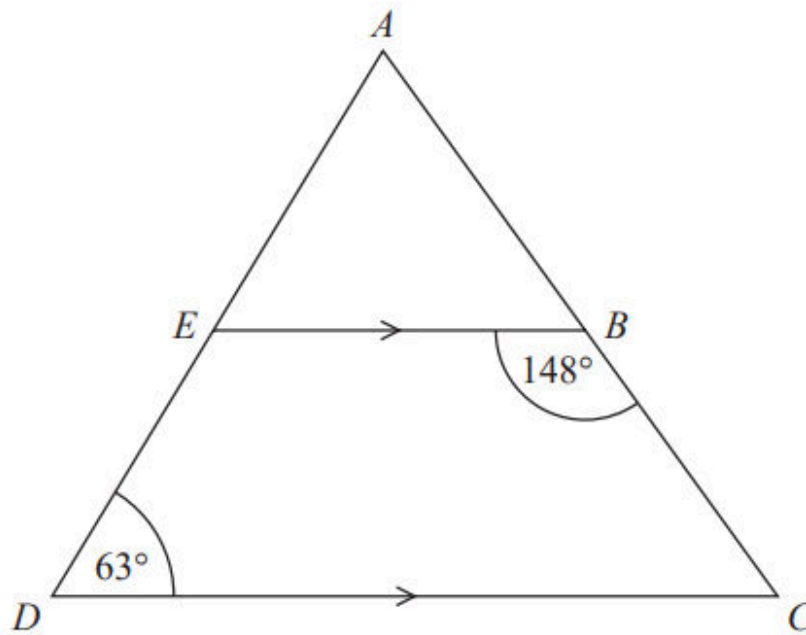


ACD and BCE are straight lines.

Work out the size of the angle marked x .

Give a reason for each stage of your working.

ADC is a triangle.



AED and ABC are straight lines.

EB is parallel to DC .

Work out the size of angle EAB .

You must give a reason for each stage of your working.

Interior Angles

There is a formula for the sum of the interior angles inside a shape:

$$(n - 2) \times 180$$

n ---> number of sides

Triangle ---> $(3-2) \times 180 = 180$ degrees

Quadrilateral ---> $(4-2) \times 180 = 360$ degrees

Note: If the shape is **regular** this means all the angles are the same. You can therefore divide the total interior angles by the amount of sides to find each individual interior angle:

$$\frac{(n - 2) \times 180}{n}$$

Example:

Work out the size of each interior angle inside a regular pentagon.

Pentagon ---> 5 sided shape

Sum of interior angles = $(5-2) \times 180 = 540$

Each interior angle = $540 \div 5 = 108$ degrees

Exterior Angles

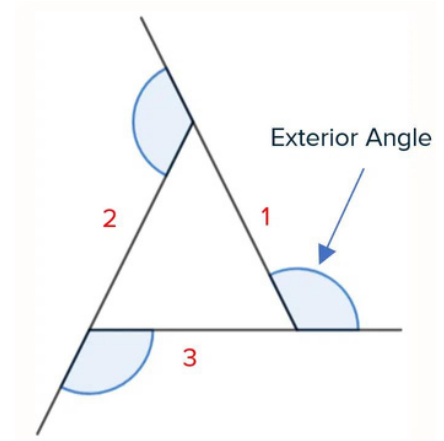
There is a formula to find the exterior angle of a regular shape:

$$360 \div n$$

n ---> number of sides

Triangle ---> $360 \div 3 = 120$ degrees

Note: This formulae only works for regular shapes.



Example:

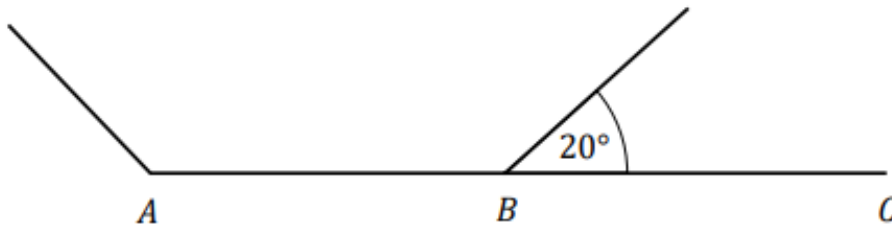
Each exterior angle of a regular polygon is 15 degrees.

Work out the number of sides of the polygon.

$$360 \div n = 15$$

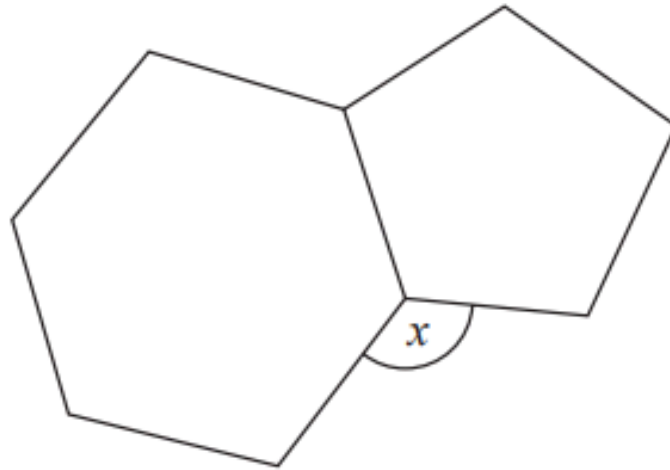
$$n = 360 \div 15 = 24 \text{ sides}$$

The diagram below shows a regular polygon.



Find the number of sides of the polygon.

Here is a regular hexagon and a regular pentagon.



Work out the size of the angle marked x .

You must show all your working.