

Name

Class



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# Angle facts

(9 – 1) Topic booklet

These questions have been collated from previous years GCSE Mathematics papers.

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Total Marks

## Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

## Information

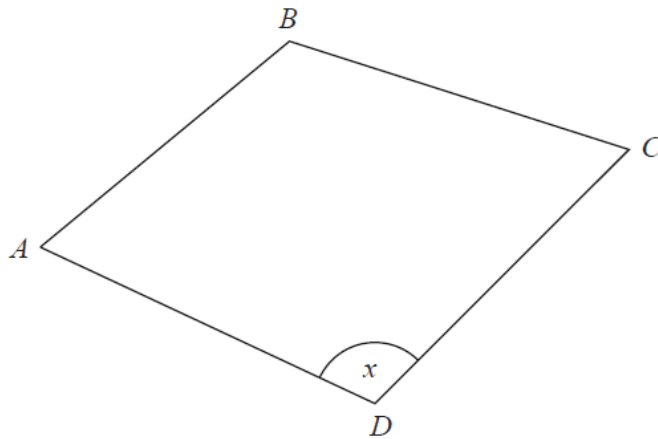
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

## Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

**Answer ALL questions**  
**Write your answers in the space provided.**  
**You must write down all the stages in your working.**

**6** Here is a quadrilateral  $ABCD$ .



- (a) Measure the length of the side  $AB$ .  
Give your answer in centimetres.

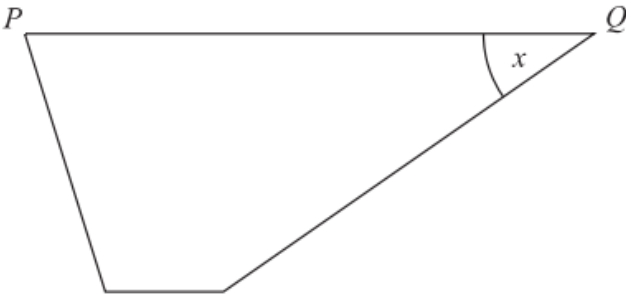
..... centimetres  
(1)

- (b) Measure the size of the angle marked  $x$ .

.....  
(1)

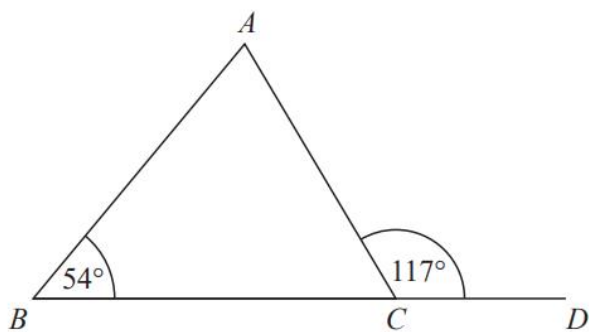
6 Here is a trapezium.

This diagram is accurately drawn.



(a) Measure the length of the line  $PQ$ .  
.....cm  
(1)

(b) Measure the size of the angle marked  $x$ .  
..... $^{\circ}$   
(1)

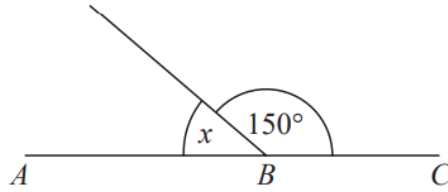


$BCD$  is a straight line.

$ABC$  is a triangle.

Show that triangle  $ABC$  is an isosceles triangle.

Give a reason for each stage of your working.



$ABC$  is a straight line.

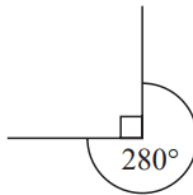
(a) (i) Work out the size of the angle marked  $x$ .

(1)

(ii) Give a reason for your answer.

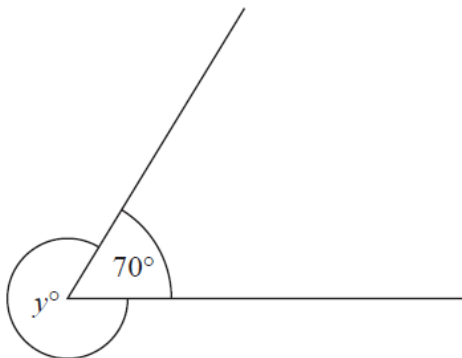
(1)

The diagram below is wrong.



(b) Explain why.

(1)



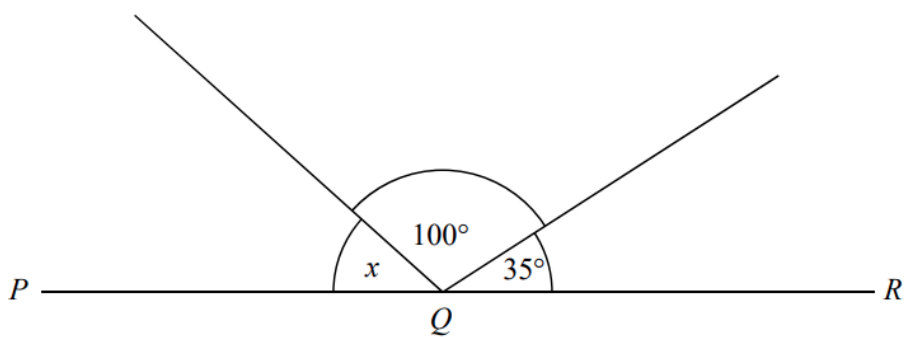
(a) Find the value of  $y$ .

$y = \dots\dots\dots$   
(1)

(b) Give a reason for your answer.

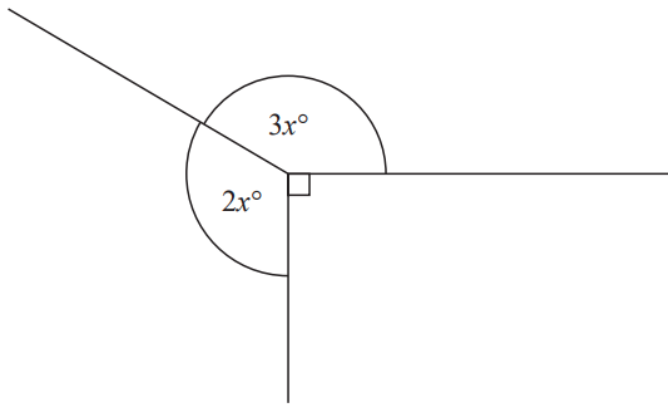
.....  
.....  
.....  
(1)

9  $PQR$  is a straight line.



Work out the size of angle  $x$ .

9



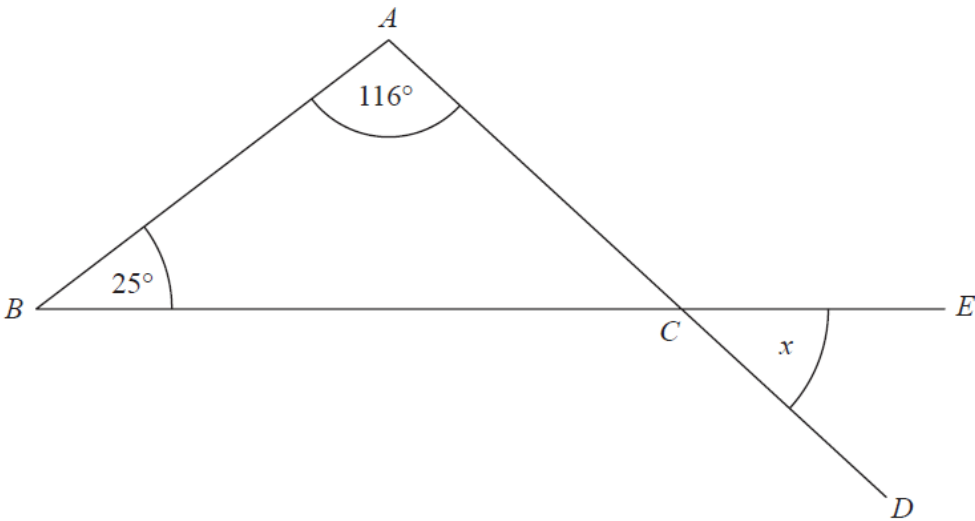
Find the value of  $x$ .

June 2017 – Paper 2F

(Total for Question 9 is 3 marks)



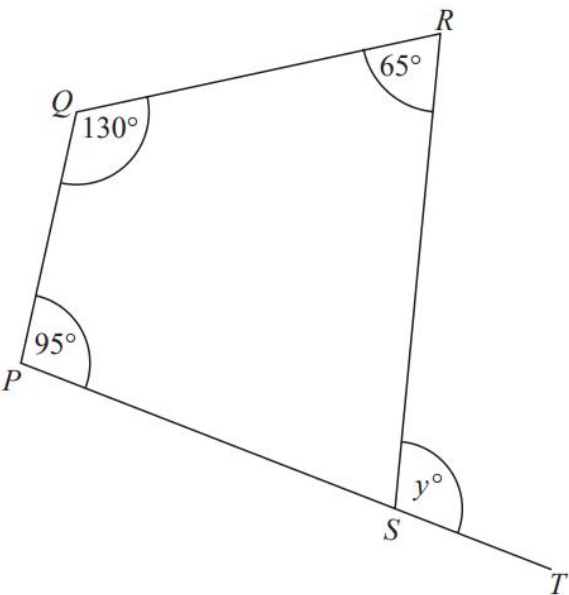
11 The diagram shows a triangle  $ABC$ .



$ACD$  and  $BCE$  are straight lines.

Work out the size of the angle marked  $x$ .  
Give a reason for each stage of your working.

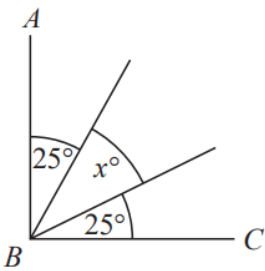
- 11  $PQRS$  is a quadrilateral.  
 $PST$  is a straight line.



Find the value of  $y$ .

$y = \dots\dots\dots$

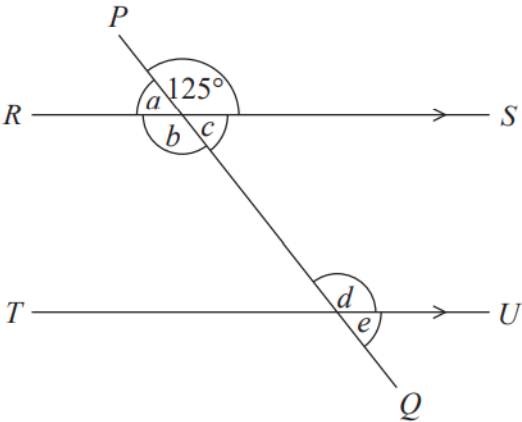
12  $AB$  and  $BC$  are perpendicular lines.



(a) Find the value of  $x$ .

$x = \dots\dots\dots$   
(2)

$RS$  and  $TU$  are parallel lines.  
 $PQ$  is a straight line.



An angle of size  $125^\circ$  is shown on the diagram.

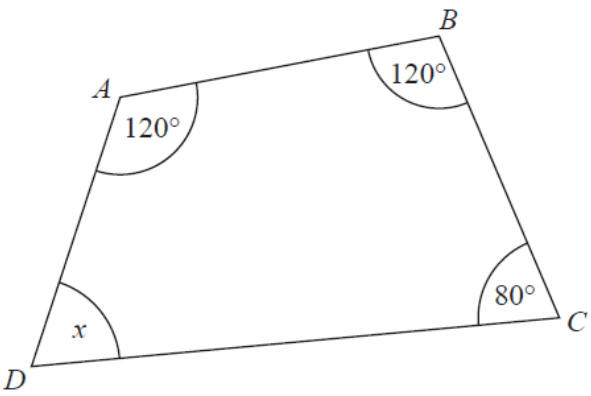
(b) (i) Write down the letter of one other angle of size  $125^\circ$   
Give a reason for your answer.

.....  
.....  
(2)

(ii) Explain why  $a + b + c = 235^\circ$

.....  
.....  
.....  
(1)

13  $ABCD$  is a quadrilateral.



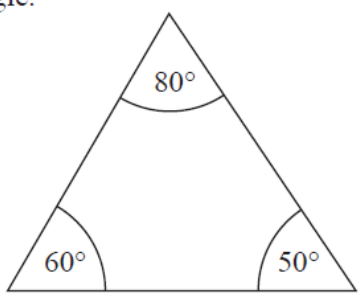
(a) (i) Work out the size of angle  $x$ .

.....  
(1)

(ii) Give a reason for your answer.

.....  
.....  
.....  
(1)

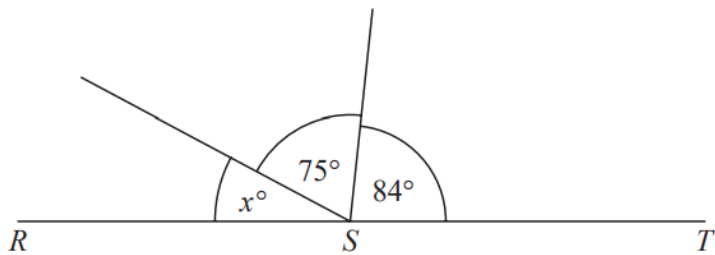
The diagram below shows a triangle.



The diagram is wrong.

(b) Explain why.

.....  
.....  
.....  
(1)



$RST$  is a straight line.

(i) Work out the value of  $x$ .

(2)

(ii) Give a reason for your answer.

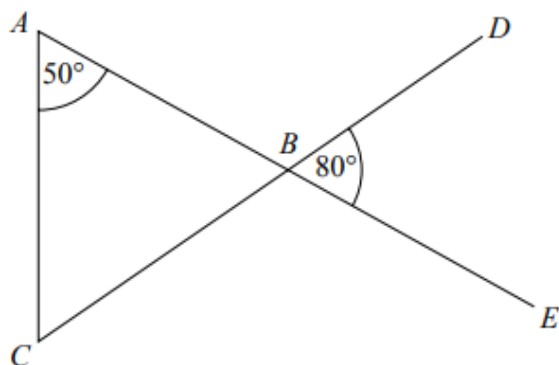
(1)

**13** The size of the largest angle in a triangle is 4 times the size of the smallest angle.  
The other angle is  $27^\circ$  less than the largest angle.

Work out, in degrees, the size of each angle in the triangle.  
You must show your working.

.....<sup>o</sup> , .....<sup>o</sup> , .....<sup>o</sup>

13

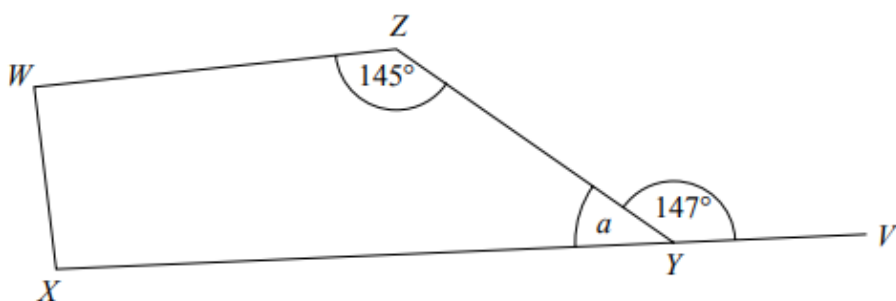


*ABE* and *CBD* are straight lines.

Show that triangle *ABC* is an isosceles triangle.

Give a reason for each stage of your working.

13



$WXYZ$  is a quadrilateral.

$XYV$  is a straight line.

(a) (i) Find the size of the angle marked  $a$ .

o

(ii) Give a reason for your answer.

(2)

Angle  $ZWX = \text{angle } WXY$

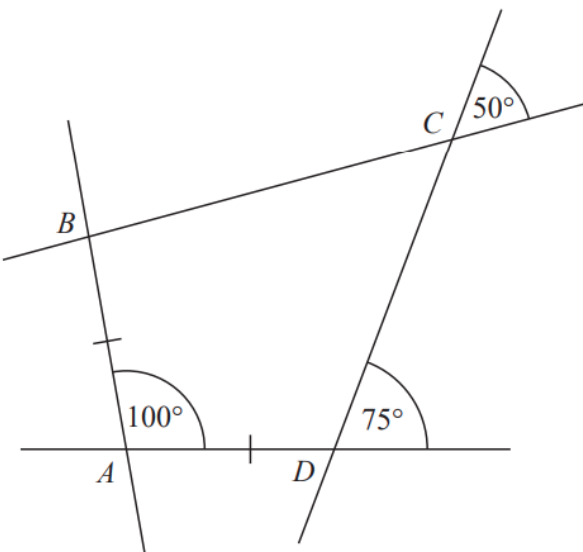
(b) Work out the size of angle  $ZWX$ .

o

(2)



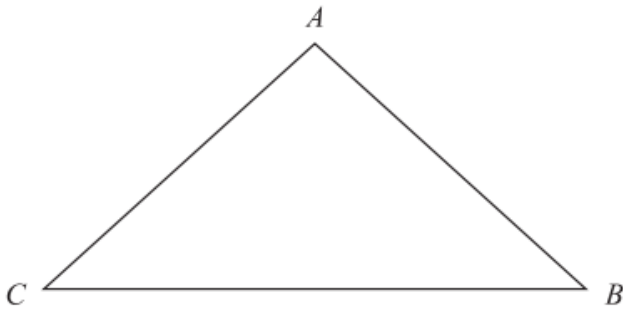
14 The diagram shows quadrilateral  $ABCD$  with each of its sides extended.



$AB = AD$

Show that  $ABCD$  is a kite.  
Give a reason for each stage of your working.

14 Here is a triangle  $ABC$ .



Mark, with the letter  $y$ , the angle  $CBA$ .

(1)

Specimen 1 – Paper 3F

(Total for Question 14 is 1 mark)

15 Jenna measures all the angles around a point.

Her results are  $23^\circ$ ,  $145^\circ$ ,  $23^\circ$  and  $69^\circ$

Explain why these results cannot be true.

.....

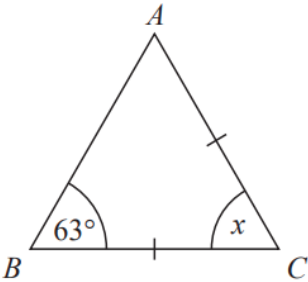
.....

.....

November 2021 – Paper 3F

(Total for Question 15 is 1 mark)

15 Mary needs to work out the size of angle  $x$  in this diagram.



She writes

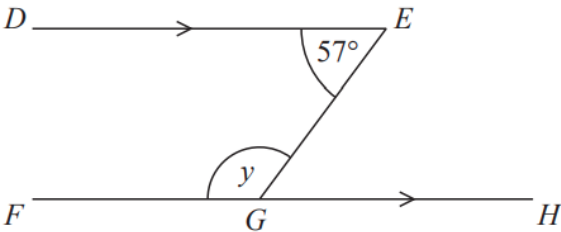
$x = 63^\circ$  because base angles of an isosceles triangle are equal.

Mary is wrong.

(a) Explain why.

(1)

William needs to work out the size of angle  $y$  in this diagram.



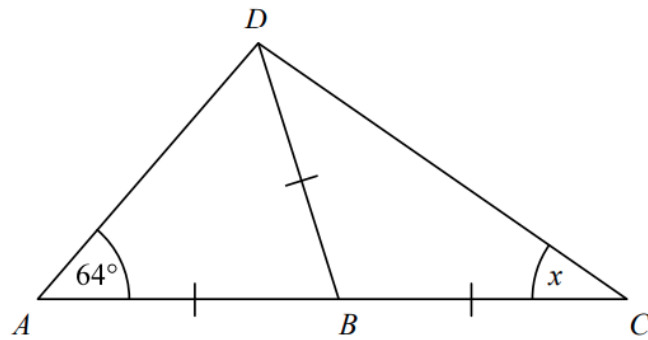
William writes

Working	Reason
angle $EGH = 57^\circ$	because corresponding angles are equal
$y = 180^\circ - 57^\circ$ $y = 123^\circ$	because angles on a straight line add up to $180^\circ$

One of William's reasons is wrong.

(b) Write down the correct reason.

(1)



$ABC$  is a straight line.

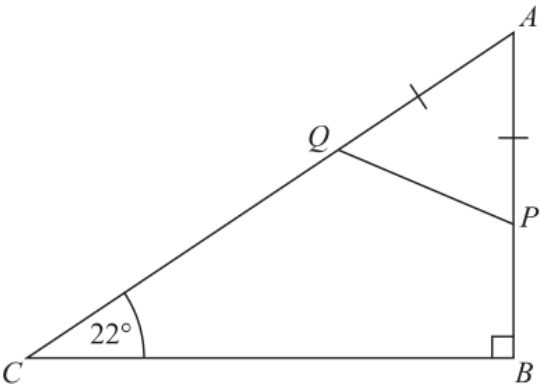
$AB = BC = BD$ .

Angle  $DAB = 64^\circ$

Work out the size of the angle marked  $x$ .

Give a reason for each stage of your working.

17  $ABC$  is a right-angled triangle.



$P$  is a point on  $AB$ .  
 $Q$  is a point on  $AC$ .  
 $AP = AQ$ .

Work out the size of angle  $AQP$ .  
You must give a reason for each stage of your working.

17  $ABC$  is an isosceles triangle.  
When angle  $A = 70^\circ$ , there are 3 possible sizes of angle  $B$ .

(a) What are they?

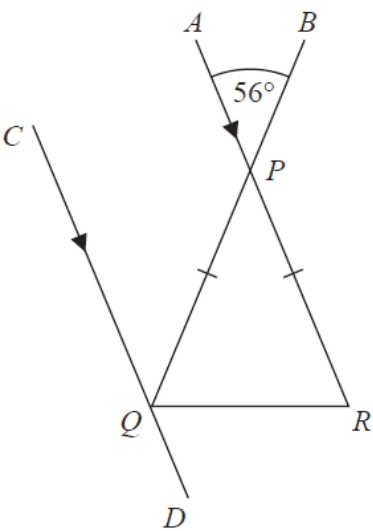
.....<sup>o</sup> , .....<sup>o</sup> , .....<sup>o</sup>  
(3)

When angle  $A = 120^\circ$ , there is only one possible size of angle  $B$ .

(b) Explain why.

.....  
.....  
(1)

20 In the diagram,  $PQR$  is an isosceles triangle with  $PQ = PR$ .

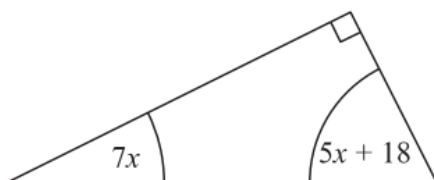


$APR$  and  $CQD$  are parallel lines.  
 $BPQ$  is a straight line.

Angle  $APB = 56^\circ$

Work out the size of angle  $CQR$ .  
Give a reason for each stage of your working.

**20** The diagram shows a right-angled triangle.

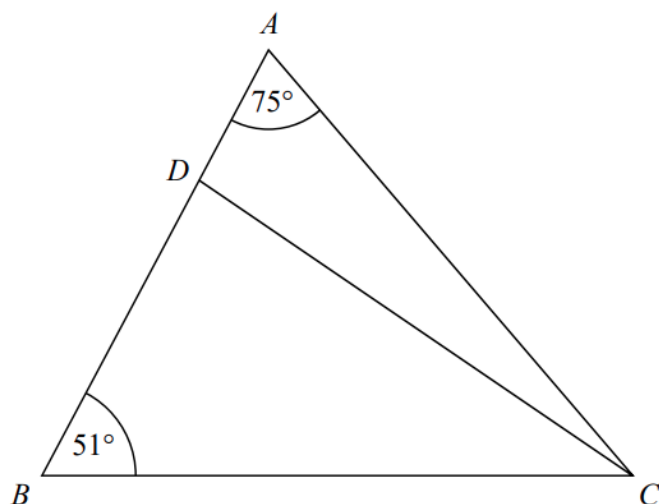


All the angles are in degrees.

Work out the size of the smallest angle of the triangle.



24 The diagram shows triangle  $ABC$ .

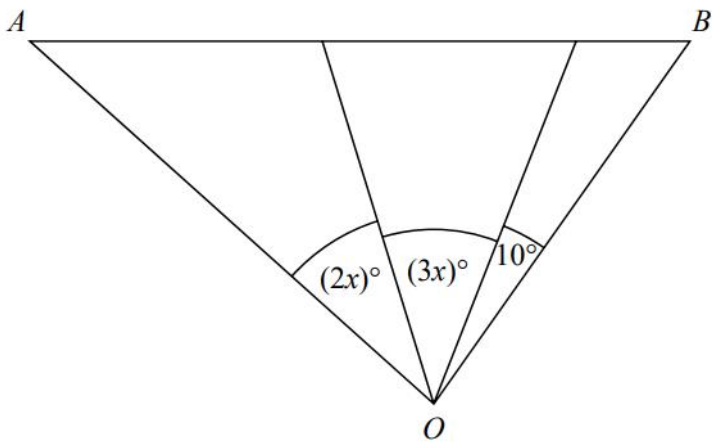


$ADB$  is a straight line.

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

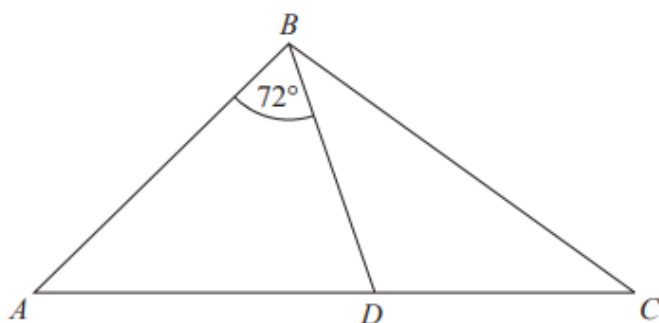
Work out the size of angle  $BDC$ .

28 The diagram shows triangle  $AOB$ .



Angle  $AOB$  is **not** an obtuse angle.

Find the greatest value of  $x$ .  
You must show all your working.



$ABC$  is an isosceles triangle with  $BA = BC$ .

$D$  lies on  $AC$ .

$ABD$  is an isosceles triangle with  $AB = AD$ .

Angle  $ABD = 72^\circ$

Show that the triangle  $BCD$  is isosceles.

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