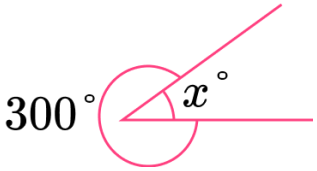
Angles Around A Point - Worksheet

Skill

Group A - Core skill practice

Calculate the size of the angle x for each diagram.

1)



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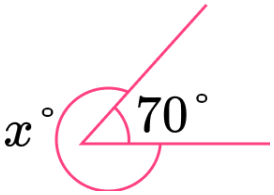

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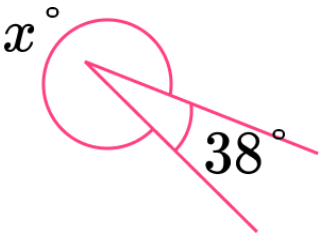

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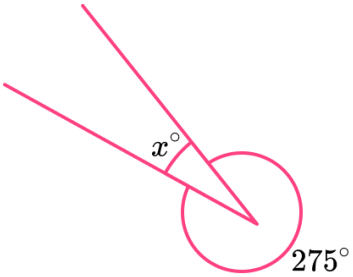

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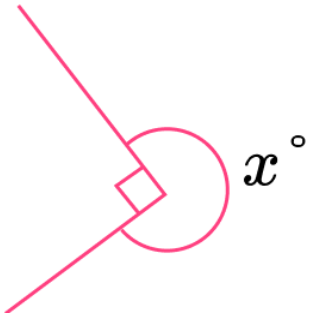

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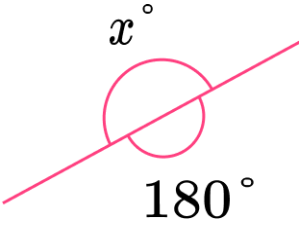

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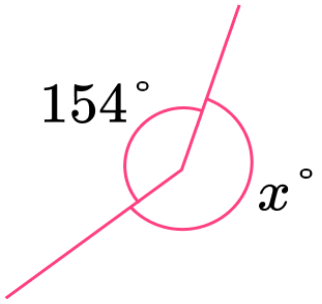

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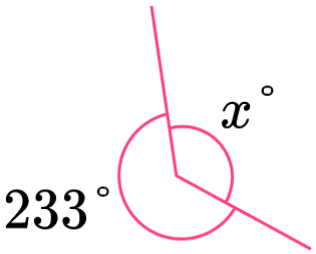

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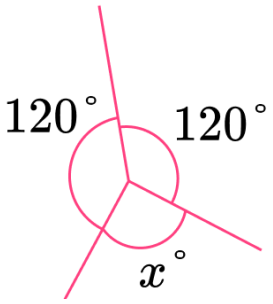

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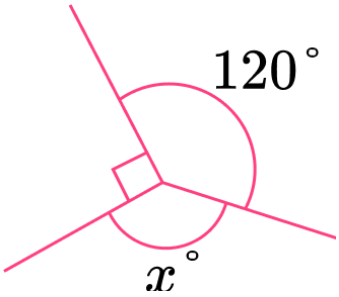

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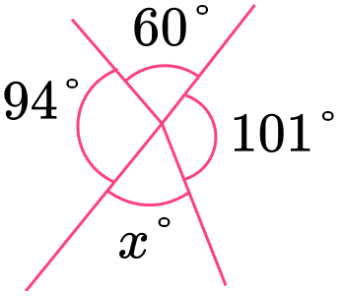

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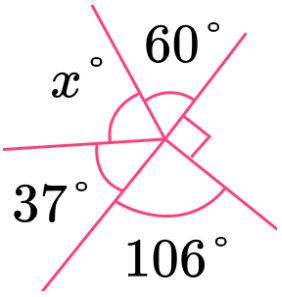
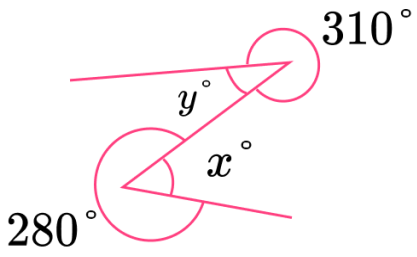


Angles Around A Point - Worksheet

Group B - Complex diagrams

Calculate the size of the missing angles in each diagram.

1)



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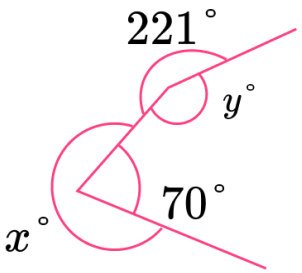

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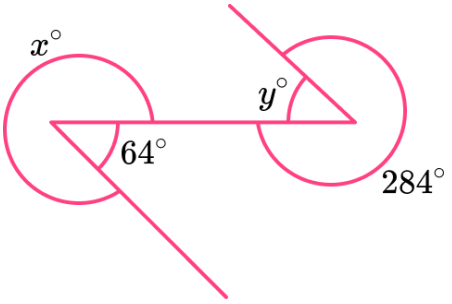

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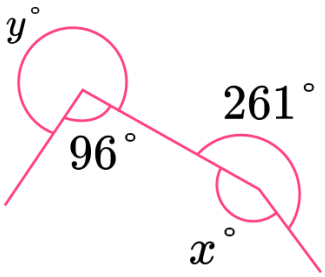

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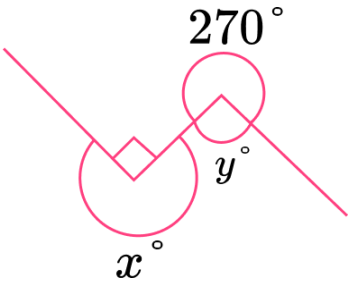

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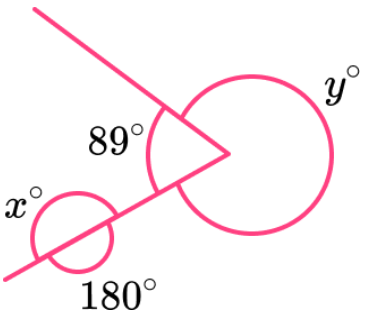

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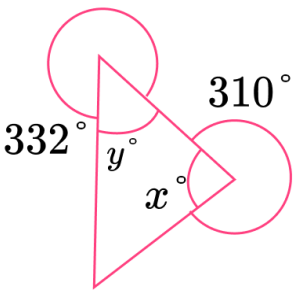

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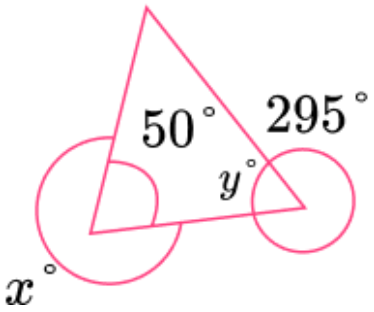

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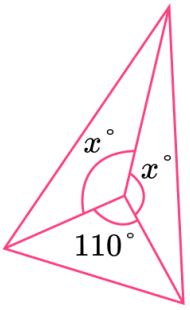

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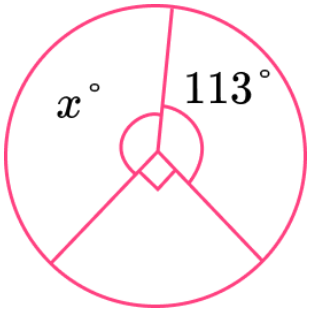

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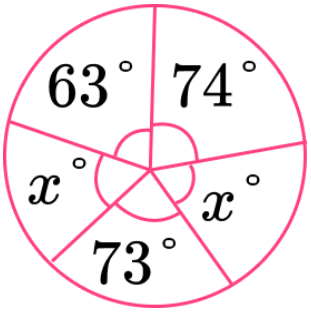

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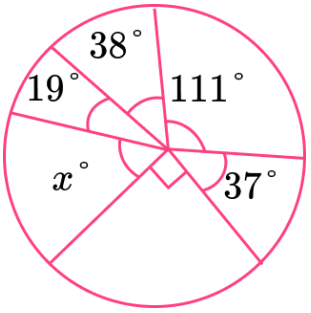
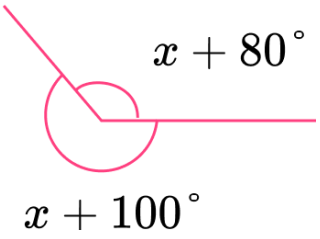


Angles Around A Point - Worksheet

Group C - Form and solve equations

Calculate the value for x by forming and solving an equation for each diagram.

1)



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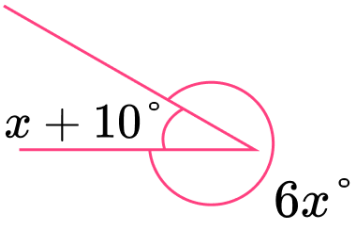

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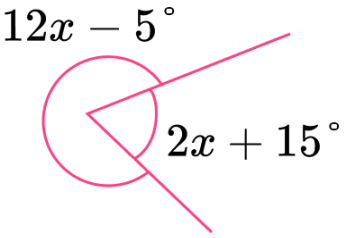

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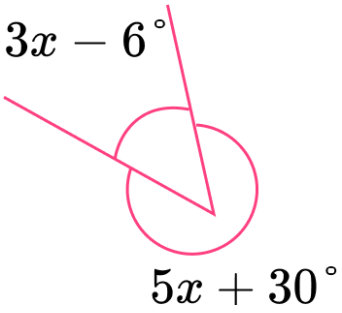

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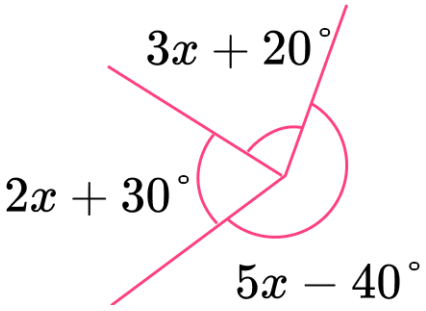

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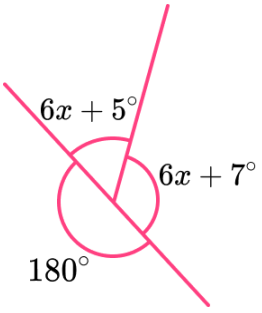

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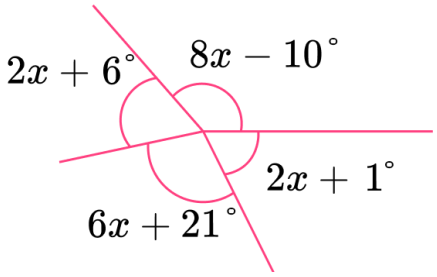

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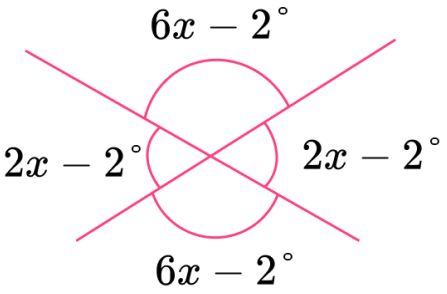

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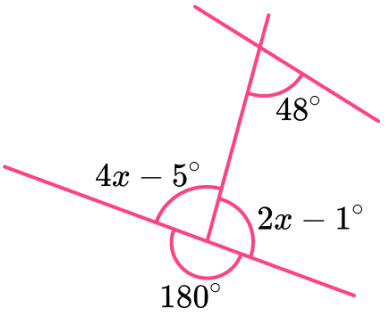

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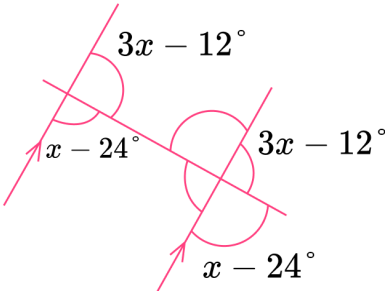

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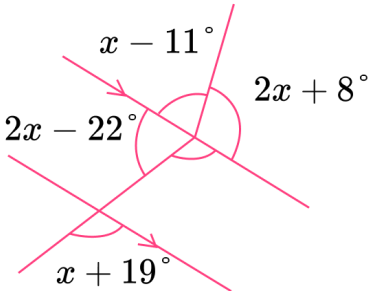

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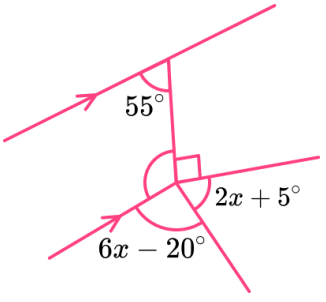
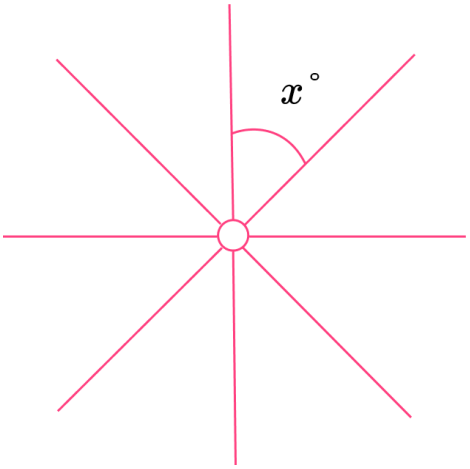


Angles Around A Point - Worksheet

Applied

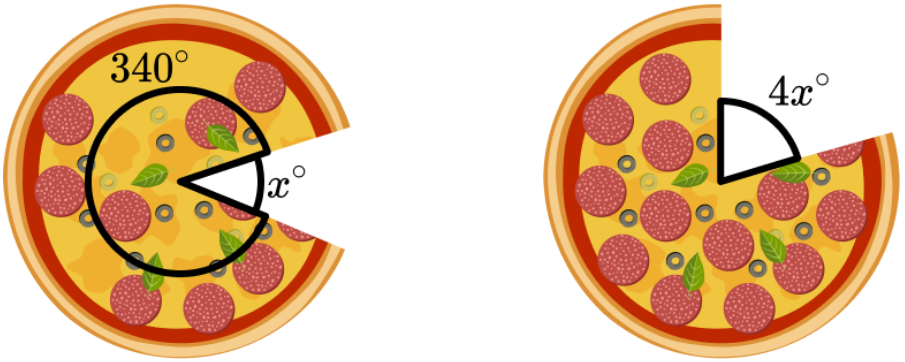
1) **(a)** A radio mast has 8 structural cables attached at equal points around the mast that secure it to the ground.



The angle between each cable is $x°$. Calculate the size of angle x.

(b) After a season of very strong winds, more cables must be added so that the angle between each cable is $30°$. How many more cables are required?

2) **(a)** A family has made pizzas for a party.

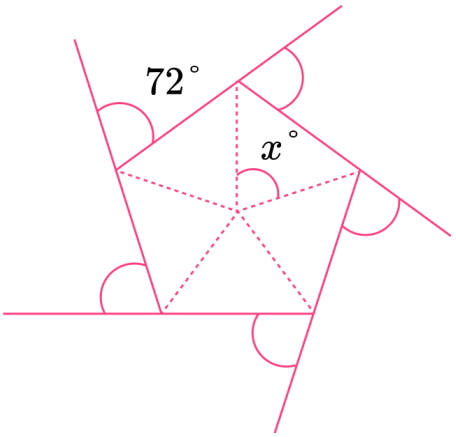


The pizzas are cut into slices. The adults cut slices 4 times the angle for the children x. Calculate the size of the angle for an adult pizza slice.

(b) There were 15 people at the party. 8 of them are children. On average, each child has 2 slices of pizza and each adult has 3 slices of pizza. How many whole pizzas were made?

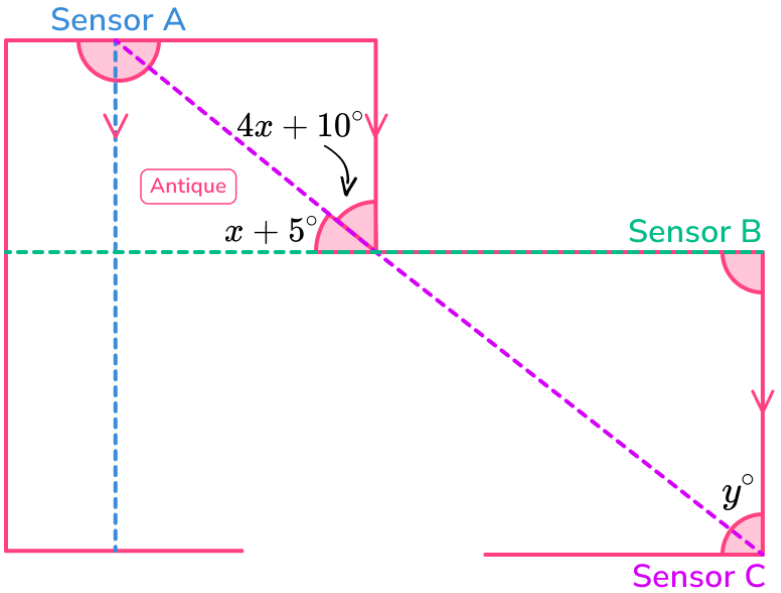
Angles Around A Point - Worksheet

3) **(a)** Show that the exterior angle of a regular pentagon is equal to 72°.



(b) Show that the angle x at the centre of the shape is the same as the exterior angle for a regular pentagon.

4) **(a)** Three infrared light movement sensors surround an antique in a gallery. The location of the sensors and their associated beam of light are shown in the diagram below.



If the beam of infrared light is broken, the sensor is activated and an alarm will sound. Calculate the angle y.

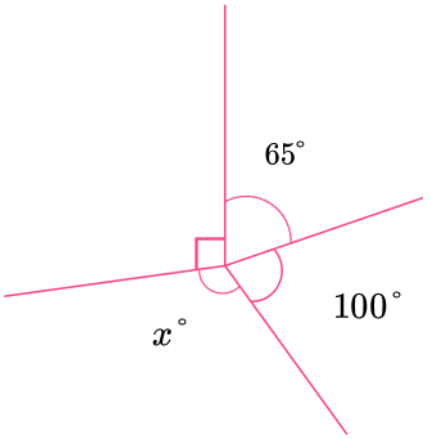
(b) The antique must be protected by at least 2 motion sensors from the entrance way. Is the antique protected? Explain your answer.

Angles Around A Point - Exam Questions

1) The diagram shows four angles meeting at a point.

Work out the value of x.

Give a reason for your answer.



.....

(3 marks)

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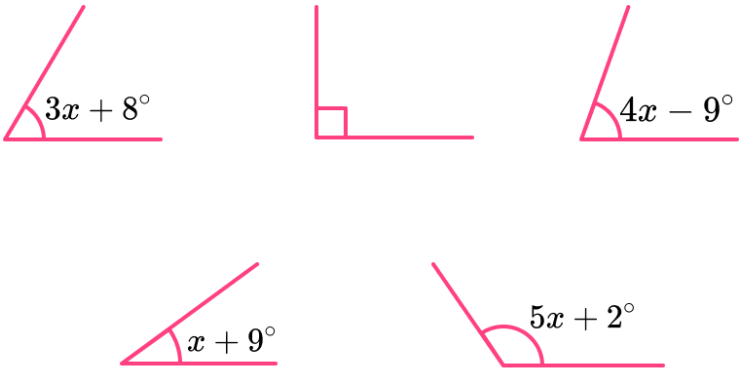
2) Below are 5 angles of varying sizes.



(a) Write an expression for the sum of the angles. Write your answer in the form $ax + b$ where a and b are integers.

.....

(2)

(b) The sum of their angles is equal to 360°. Calculate the value of x.

.....

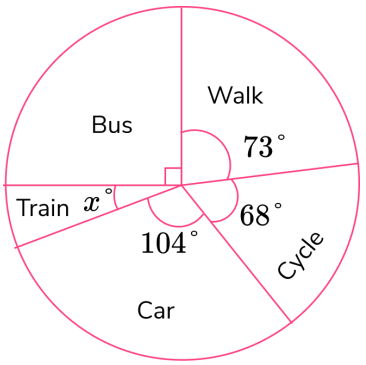
(2)

(4 marks)

Angles Around A Point - Exam Questions

3) **(a)** The pie chart shows data for the different ways a group of 3600 people travel to work.

Calculate the size of angle x.



.....

(2)

(b) How many people commuted to work using the bus?

.....

(2)

(4 marks)

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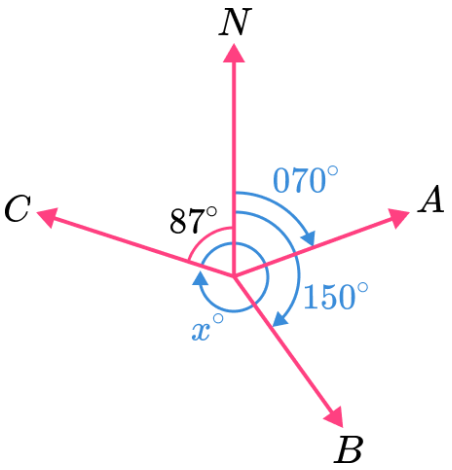
4) **(a)** Three walking groups set off from their campsite at different bearings.

Group A set off at a bearing of 070° and Group B set off at a bearing of 150°.

What bearing did Group C start walking at?



.....

(2)

(b) After 10 minutes, Group C turns to walk directly South. What angle must they turn in a clockwise direction so they face South?

.....

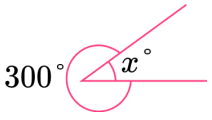
(2)

(4 marks)

Angles Around a Point - Answers

	Question	Answer
	Skill Questions	
Group A	Calculate the size of the angle x for each diagram.	

1)



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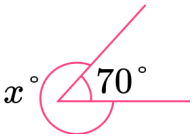

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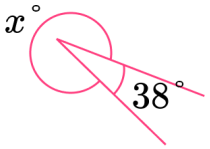

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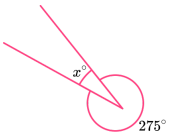

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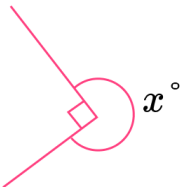

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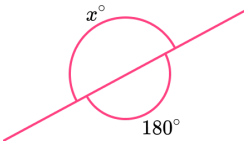

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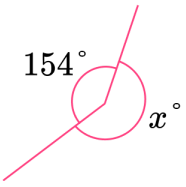

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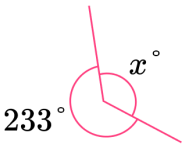
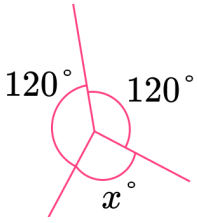


9)



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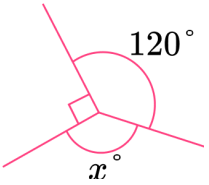
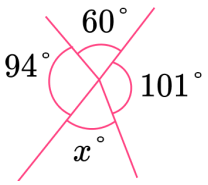
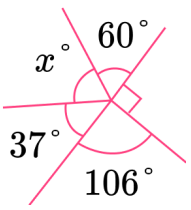


11)



12)



1) $x = 60°$

2) $x = 290°$

3) $x = 322°$

4) $x = 85°$

5) $x = 270°$

6) $x = 180°$

7) $x = 206°$

8) $x = 127°$

9) $x = 120°$

10) $x = 150°$

11) $x = 105°$

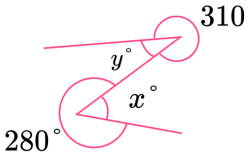
12) $x = 67°$

Angles Around a Point - Answers

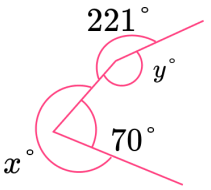
Group B

Calculate the size of the missing angles in each diagram.

1)



2)



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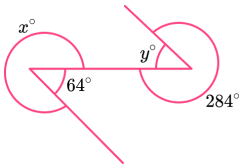
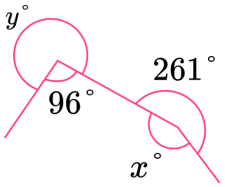
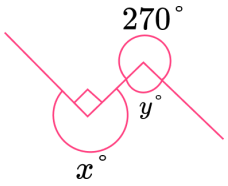


4)



5)



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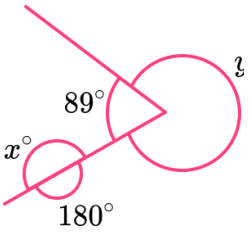

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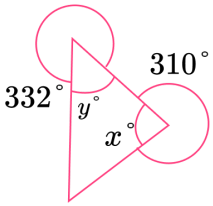
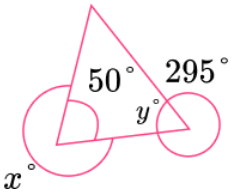
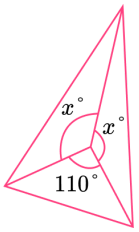


8)



9)



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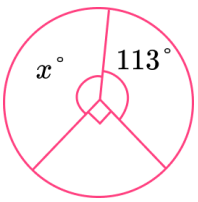

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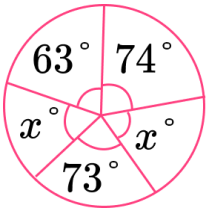
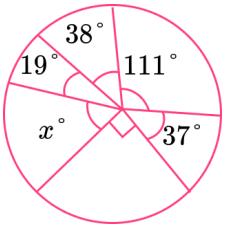


12)



1) $x = 80°$, $y = 50°$

2) $x = 290°$, $y = 139°$

3) $x = 296°$, $y = 76°$

4) $x = 99°$, $y = 264°$

5) $x = 270°$, $y = 90°$

6) $x = 180°$, $y = 271°$

7) $x = 50°$, $y = 28°$

8) $x = 310°$, $y = 65°$

9) $x = 125°$

10) $x = 157°$

11) $x = 75°$

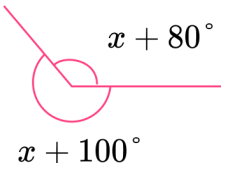
12) $x = 65°$

Angles Around a Point - Answers

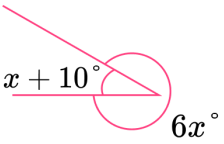
Group C

Calculate the value for x by forming and solving an equation for each diagram.

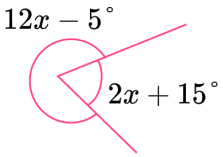
1)



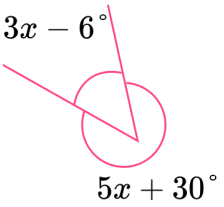
2)



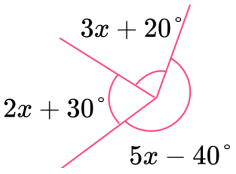
3)



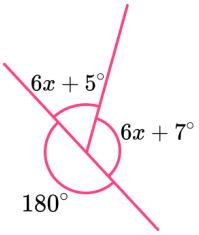
4)



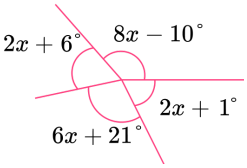
5)



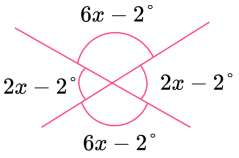
6)



7)



8)



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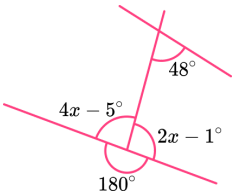
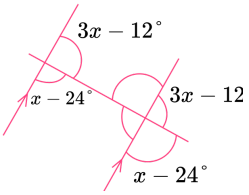
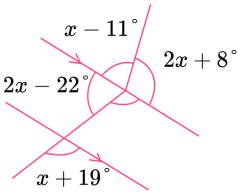


10)



11)



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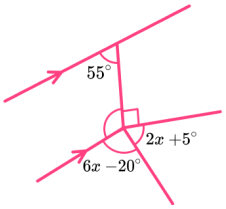


1) $x = 90°$

2) $x = 50°$

3) $x = 25°$

4) $x = 42°$

5) $x = 35°$

6) $x = 14°$

7) $x = 19°$

8) $x = 23°$

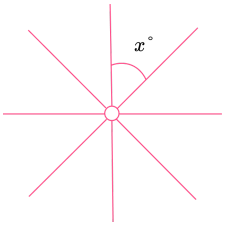
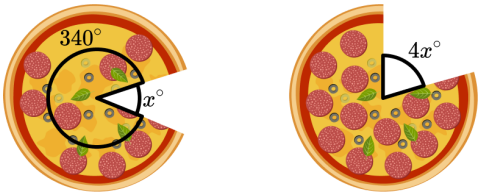
9) $x = 31°$

10) $x = 54°$

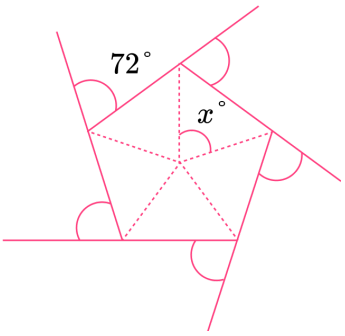
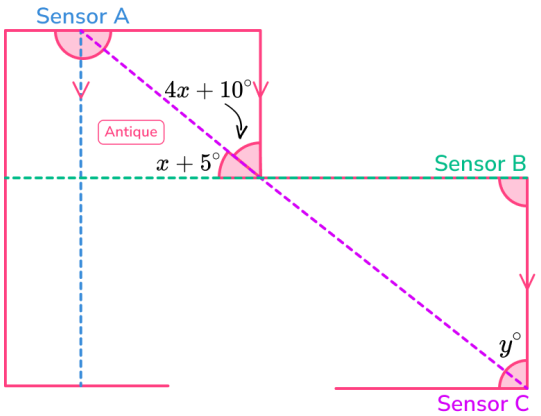
11) $x = 61°$

12) $x = 20°$

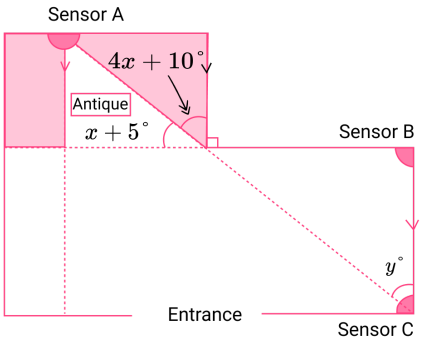
Angles Around a Point - Answers

	Question	Answer
	Applied Questions	
1)	**(a)** A radio mast has 8 structural cables attached at equal points around the mast that secure it to the ground.  The angle between each cable is $x°$. Calculate the size of angle x.	**(a)** $360 \div 8 = 45°$ $x = 45°$
	(b) After a season of very strong winds, more cables must be added so that the angle between each cable is $30°$. How many more cables are required?	**(b)** $360 \div 30 = 12$ $12 - 8 = 4$ cables
2)	**(a)** A family has made pizzas for a party.  The pizzas are cut into slices. The adults cut slices 4 times the angle for the children x. Calculate the size of the angle for an adult pizza slice.	**(a)** $x = 360 - 340 = 20°$ $4 \times 20 = 80°$
	(b) There were 15 people at the party. 8 of them are children. On average, each child has 2 slices of pizza and each adult has 3 slices of pizza. How many whole pizzas were made?	**(b)** $8 \times 2 \times 20° = 320°$ eaten $7 \times 3 \times 80° = 1680°$ eaten Total: $320 + 1680 = 2000°$ $2000° \div 360° = 5.56\ (2dp)$ 6 pizzas were made

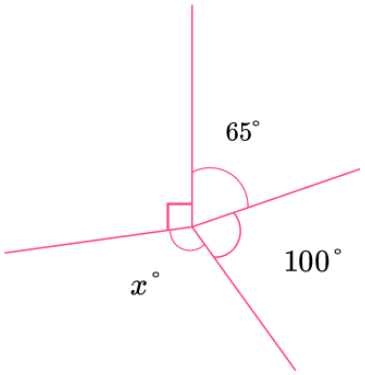
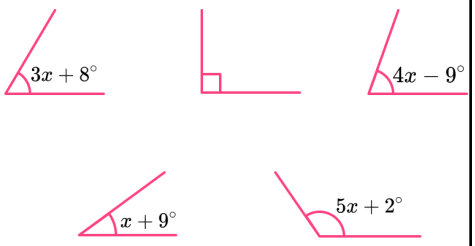
Angles Around a Point - Answers

3)	**(a)** Show that the exterior angle of a regular pentagon is equal to 72°.  **(b)** Show that the angle x at the centre of the shape is the same as the exterior angle for a regular pentagon.	**(a)** The sum of exterior angles for any polygon is equal to 360° so $360 \div 5 = 72°$. **(b)** $x = 360 \div 5 = 72°$
4)	**(a)** Three infrared light movement sensors surround an antique in a gallery. The location of the sensors and their associated beam of light are shown in the diagram below.  If the beam of infrared light is broken, the sensor is activated and an alarm will sound. Calculate the angle y - the angle between Sensors A and B from Sensor C.	**(a)** $4x + 10 + x + 5 = 90$ $5x + 15 = 90$ $5x = 75$ $x = 15°$ $y = 4x + 10$ $y = 4 \times 15 + 10$ $y = 70°$

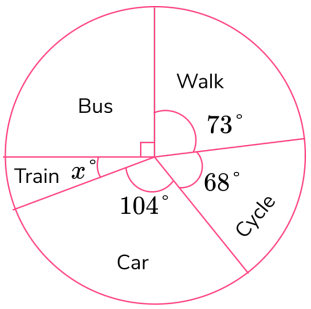
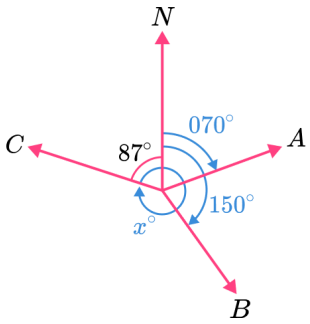
Angles Around a Point - Answers

4)	**(b)** The antique must be protected by at least 2 motion sensors from the entrance way. Is the antique protected? Explain your answer.	**(b)**  No. The shaded regions are protected by at least 2 motion sensors and the antique can be reached by crossing only sensor B.

Angles Around a Point - Mark Scheme

	Question	Answer	
	Exam Questions		
1)	The diagram shows four angles meeting at a point.  Work out the value of x. Give a reason for your answer.	$x = 360 - (90 + 65 + 100)$ $x = 105$ Reason: angles around a point sum to 360°.	**(1)** **(1)** **(1)**
2) (a)	Below are 5 angles of varying sizes.  Write an expression for the sum of the angles. Write your answer in the form $ax + b$ where a and b are integers.	**(a)** $(3x + 8) + 90 + (4x - 9) + (x + 9) + (5x + 2)$ $13x + 100$	**(1)** **(1)**
(b)	The sum of their angles is equal to 360°. Calculate the value of x.	**(b)** $13x + 100 = 360$ $13x = 260$ $x = 20°$	**(1)** **(1)**

Angles Around a Point - Mark Scheme

3) (a)	The pie chart shows data for the different ways a group of 3600 people travel to work.  Calculate the size of angle x.	**(a)** $73 + 68 + 104 + 90 = 335$ $x = 360 - 335 = 25°$	**(1)** **(1)**
(b)	How many people commuted to work using the bus?	**(b)** $3600 \div 4$ $= 900$ people	**(1)** **(1)**
4) (a)	Three walking groups set off from their campsite at different bearings. Group A set off at a bearing of 070° and Group B set off at a bearing of 150°. What bearing did Group C start walking at?  	**(a)** $360 - 87$ $= 273°$	**(1)** **(1)**
(b)	After 10 minutes, Group C turns to walk directly South. What angle must they turn in a clockwise direction so they face South?	**(b)** $180 + 87$ $= 267°$	**(1)** **(1)**