

WA6MMGTW4

Two-dimensional space and structures

Core + Challenge

Finding Unknown Angles

I can find unknown angles using right angles, straight lines, angles at a point and vertically opposite angles.

Name: _____ Date: _____ Score: _____ / 56

Key idea

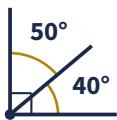
Angles in a **right angle** add to 90° , on a **straight line** to 180° and **at a point** to 360° .

Where two straight lines cross, **vertically opposite** angles are **equal**.

Angle AOB means the angle at O between OA and OB. The vertex letter goes in the middle.

Always **name the fact** you use. Example: on a straight line, $180^\circ - 150^\circ = 30^\circ$.

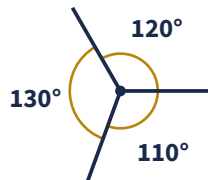
Right angle



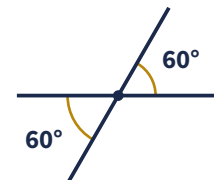
Straight line: 180°



At a point: 360°



Vertically opposite



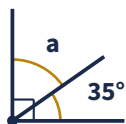
A

Warm up *use the angle facts*

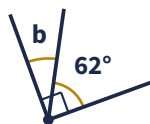
/ 16 marks

Find each **lettered** angle. The small square marks a right angle. 1 mark each.

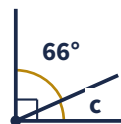
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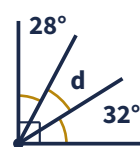
2



3



4



Angles on a **straight line**. Find each lettered angle. 1 mark each.

5



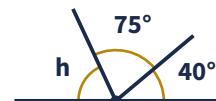
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7



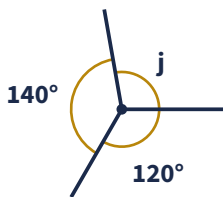
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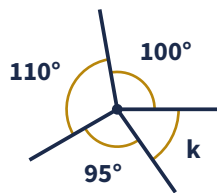
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Angles **at a point**. Find each lettered angle. 1 mark each.

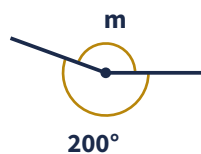
9



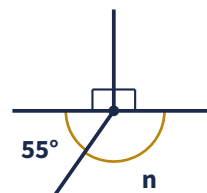
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11

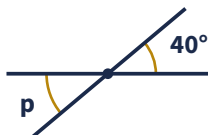


12

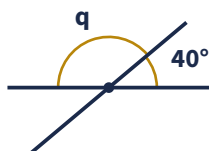


Two **straight lines** cross. Find each lettered angle. 1 mark each.

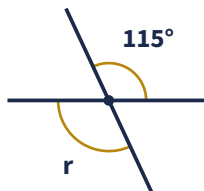
13



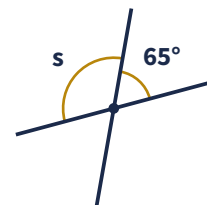
14



15



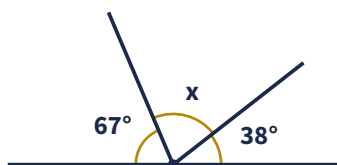
16



B Practise *use the skill*

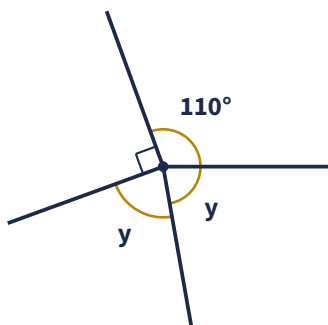
/ 21 marks

- 1 Three angles sit on a straight line. Find angle x. Name the fact you use. [2 marks]



Answer: _____

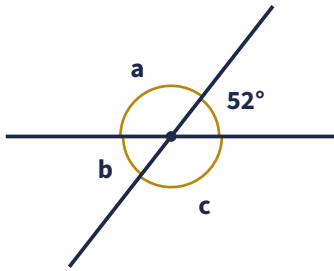
- 2 The two angles marked y are **equal**. Find y. Name the fact you use. [2 marks]



Answer: _____

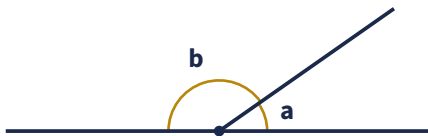
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- 3 Two straight lines cross. Find angles a , b and c . Write the fact you used for each one. [3 marks]



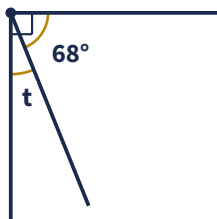
Answer: _____

- 4 **Measure** angle a with a protractor. Then **calculate** angle b without measuring. Check b by measuring it. [2 marks]



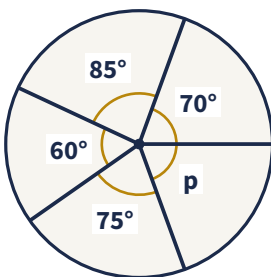
Answer: _____

- 5 A builder fixes a diagonal brace into the top corner of a door frame. The top and the side of the frame meet at a **right angle**. The brace makes 68° with the top. Find angle t , between the brace and the side. [2 marks]



Answer: _____

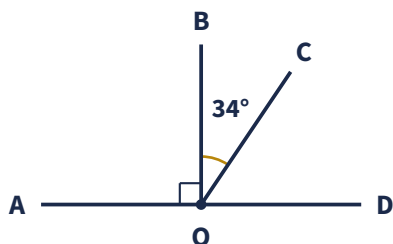
- 6 A pizza is cut into 5 slices from the centre. Four of the angles are shown. Find angle p . Name the fact you use. [2 marks]



Answer: _____

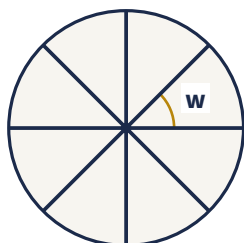
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- 7 AOD is a straight line. Angle AOB is a right angle and angle BOC is 34° . Find **angle COD** and **angle AOC**. [3 marks]



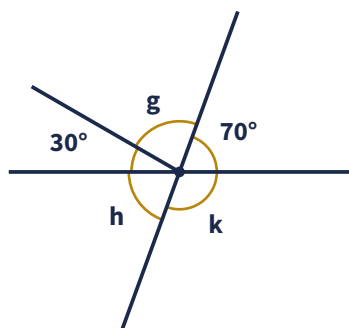
Answer: _____

- 8 A ride at the Perth Royal Show has **8** equal spokes. **a)** Find angle w between two spokes that are next to each other. **b)** Another ride has **10** equal spokes. What is the angle between them? [2 marks]



Answer: _____

- 9 Find angles g , h and k . Write the fact you used for each one. [3 marks]

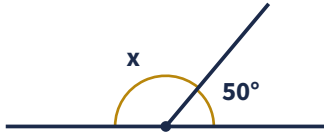


Answer: _____

C**Think it through** *explain your thinking*

/ 10 marks

- 1 Noah says $x = 360^\circ - 50^\circ = 310^\circ$. Do you agree with Noah? Explain his mistake and find x . [2 marks]



- 2 **True or false?** “Vertically opposite angles always add up to 180° .” Explain, using an example. [2 marks]

- 3 **Always, sometimes or never true?** “When two straight lines cross, all four angles are equal.” Circle one and explain. [2 marks]

Always

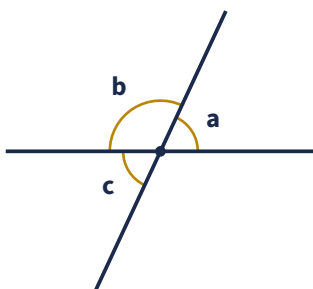
Sometimes

Never

- 4 Which set of angles could **not** fit together around a point with no gaps or overlaps? Explain. [2 marks]

Set A: 90° , 90° and 180° . **Set B:** three equal angles. **Set C:** 100° , 150° and a third angle equal to the first. **Set D:** 45° , 135° and two more equal angles.

- 5 Explain why angle a is **equal** to angle c . Use the fact about angles on a straight line in your answer. [2 marks]

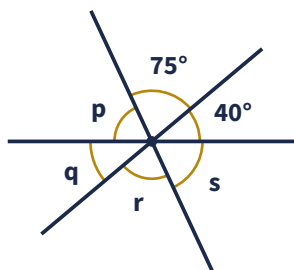


D

Challenge *stretch yourself*

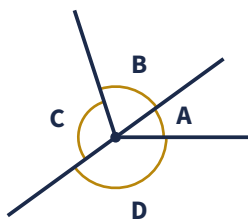
/ 9 marks

- 1 Three straight lines cross at one point. Find angles p , q , r and s . Explain each step. [3 marks]



Answer: _____

- 2 Four angles A, B, C and D meet at a point. B is **double** A, C is **three times** A and D is **four times** A. Find the size of each angle. [3 marks]



Answer: _____

- 3 Find all the possibilities. Three **different** angles sit together on a straight line. Each angle is a **multiple of 20°** (20°, 40°, 60°, ...). Find every possible set. How do you know you have them all? [3 marks]

Answer: _____

How did I go?

Warm up ___ / 16 Practise ___ / 21 Think it through ___ / 10 Challenge ___ / 9 **Total ___ / 56**

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