

Pack B • Fluency

Answer all questions. Show your working. Questions are grouped by challenge level.

1. Two equal angles sit on a straight line. Find the size of each angle. Justify that they sum to 180° .

2. Two angles on a straight line are 112° and an unknown angle. Calculate the unknown angle. Show the subtraction and verify the pair sums to 180° .

3. Four angles meet at a point. Three of them are 100° , 75° , and 60° . Calculate the fourth angle and verify all four sum to 360° .

4. A triangle has angles 90° and 35° . Calculate the third angle and verify all three sum to 180° .

5. A quadrilateral has angles 110° , 70° , and 95° . Calculate the fourth angle and verify all four sum to 360° .

6. Two lines cross and form four angles. One angle is 117° . Calculate all four angles and check they sum to 360° .

7. An angle on a straight line measures 74° . Calculate its supplementary angle (the other angle on the straight line) and show they add to 180° .

8. An isosceles triangle has two equal base angles. The angle at the top is 70° . Calculate each base angle, showing the subtraction and division. Check your answer.

9. A pair of parallel lines is cut by a transversal. One co-interior angle is 73° . Calculate the other co-interior angle and verify both sum to 180° .

10. A pair of parallel lines is cut by a transversal. One alternate angle is 131° . State and justify the alternate angle on the other side. Then calculate the co-interior angle on the same side.

11. Find angle x . Two angles on a straight line are x and 48° .
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12. Three angles meet at a point on a straight line: 43° , 98° , and x . Find x .
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13. A triangle has angles x , 72° , and 39° . Find x .
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14. An isosceles triangle has a top angle of 70° . Find each base angle.
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15. A quadrilateral has three angles: 95° , 88° , 102° . Find the fourth angle x .
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16. Find the exterior angle of a regular 9-sided polygon.
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17. Find the interior angle of a regular 8-sided polygon.
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18. Two parallel lines are cut by a transversal. A corresponding angle is 64° . Find the angle marked x on the same side of the transversal, between the parallel lines (co-interior).
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19. Two lines cross. One angle is 113° . Find all four angles formed.
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20. An equilateral triangle has all sides equal. What is each interior angle?
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21. A triangle has angles x , $2x$, and 24° . Find x and the largest angle.
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22. Two angles on a straight line are $(3x + 10)^\circ$ and $(5x - 18)^\circ$. Find x and each angle.
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23. Two angles on a straight line are in the ratio 1 : 5. Find each angle.
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24. A quadrilateral has angles x , $x + 20^\circ$, $2x$, and $x - 10^\circ$. Find x and each angle.
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25. Two parallel lines are cut by a transversal. One alternate angle is $(4x - 12)^\circ$ and the other is $(2x + 18)^\circ$. Find x .
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26. A regular polygon has 10 sides. Find its interior angle and state the name of the polygon.
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27. A regular polygon has an exterior angle of 15° . How many sides does it have?
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28. A protractor reading shows an angle of 97.4° . A second angle is 49.4° smaller. Find the second angle and state its type.
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29. The exterior angle of a triangle is 134° . One of the non-adjacent interior angles is 67° . Find the other non-adjacent interior angle.
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30. An angle is $\frac{\text{num}}{\text{den}}$ of a full turn. Find the angle in degrees and state its type.
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31. Two parallel lines are cut by a transversal. A co-interior angle is $(5x + 8)^\circ$ and the other co-interior angle is $(3x + 4)^\circ$. Find x and both angles.
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32. A pie chart shows three sectors. The first sector represents 25% of the data and the second represents 45%. Find the angle of the third sector.
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33. A regular polygon has interior angles of 140° . How many sides does it have? Then find its exterior angle.
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34. In a triangle, angle A is twice angle B, and angle C is 15° more than angle A. Find all three angles.
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35. A triangle has angles in the ratio 1 : 3 : 5. Find each angle.
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36. A survey asks 200 people their favourite colour. 90 choose blue, 50 choose red, and the rest choose green. Find the pie chart angle for green.
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37. Use the formula $(n - 2) \times 180^\circ$ to find the sum of interior angles of a 11-sided polygon. Then find each interior angle if it is regular.
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38. A triangle has angles 47.6° , 81.5° , and x° . Find x , giving your answer as a decimal.
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39. A kite has two pairs of equal angles. The angles are x , x , 130° , and 50° . Find x .
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40. A bearing is measured clockwise from North. A ship sails on a bearing of 310° . How many degrees short of a full turn is this? Give the reflex angle formed on the other side of North.
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