

Angles in a Quadrilateral Worksheet

Instructions

A quadrilateral is a polygon with four sides and four vertices. The sum of its interior angles is always 360 degrees.

Answer all questions. Show your working where possible. Use the fact that the sum of the interior angles in any quadrilateral is 360° .

1. Calculate the missing angle in a quadrilateral if the other three angles are 85° , 95° , and 110° .

2. A quadrilateral has angles x° , $2x^\circ$, $3x^\circ$, and $4x^\circ$. Find the value of x .

3. In a parallelogram, two adjacent angles are given as 120° and y° . Find the value of y .

4. A quadrilateral has angles 70° , 80° , 95° , and an unknown angle. What is the value of the unknown angle?

5. The angles of a quadrilateral are in the ratio 2:3:4:5. Find each angle.

6. In a trapezium, one pair of adjacent angles are 110° and 120° . Find the sum of the other two angles.

7. One of the angles of a quadrilateral is 90° , and the other three angles are equal. Find the size of each of the equal angles.

8. If the angles of a quadrilateral are $(x + 10)^\circ$, $(x + 30)^\circ$, $(x + 50)^\circ$, and $(x + 70)^\circ$, find the value of x .

9. In a kite, two of the angles are 80° each. The other two angles are equal. Find the value of the other two angles.

10. The angles of a quadrilateral are $3x^\circ$, $2x^\circ$, $(x + 40)^\circ$, and 100° . Find the value of x .

11. In a rectangle, all angles are equal. What is the measure of each angle?

12. The angles of a quadrilateral are given as y° , $(y + 20)^\circ$, $(y + 40)^\circ$, and $(y + 60)^\circ$. Find the value of y .

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13. The sum of three angles of a quadrilateral is 270° . What is the measure of the fourth angle?

14. In a rhombus, two adjacent angles are in the ratio 1:2. Find the measures of all the angles.

15. The exterior angles of a quadrilateral are 80° , 90° , 100° , and x° . Find the value of x .

Answer Key

1. $85^\circ + 95^\circ + 110^\circ = 290^\circ$, so missing angle $= 360^\circ - 290^\circ = \mathbf{70^\circ}$
2. $x + 2x + 3x + 4x = 10x = 360^\circ$, so $x = \mathbf{36^\circ}$
3. Adjacent angles in a parallelogram are supplementary: $120^\circ + y = 180^\circ$, so $y = \mathbf{60^\circ}$
4. $70^\circ + 80^\circ + 95^\circ = 245^\circ$, so unknown angle $= 360^\circ - 245^\circ = \mathbf{115^\circ}$
5. Let angles be $2k, 3k, 4k, 5k$. $2k + 3k + 4k + 5k = 14k = 360^\circ$, so $k = 25^\circ$. Angles: $\mathbf{50^\circ, 75^\circ, 100^\circ, 125^\circ}$
6. The sum of all angles $= 360^\circ$. Given: $110^\circ + 120^\circ = 230^\circ$, so remaining sum $= 360^\circ - 230^\circ = \mathbf{130^\circ}$
7. Let each equal angle be y . $90^\circ + 3y = 360^\circ$, so $3y = 270^\circ$, $y = \mathbf{90^\circ}$
8. $(x + 10) + (x + 30) + (x + 50) + (x + 70) = 4x + 160 = 360^\circ$, so $4x = 200^\circ$, $x = \mathbf{50^\circ}$
9. Let each of the other angles be y . $80^\circ + 80^\circ + 2y = 360^\circ$, so $2y = 200^\circ$, $y = \mathbf{100^\circ}$
10. $3x + 2x + (x + 40) + 100 = 6x + 140 = 360^\circ$, so $6x = 220^\circ$, $x = \mathbf{36.67^\circ}$
11. Rectangle: All angles are $\mathbf{90^\circ}$
12. $y + (y + 20) + (y + 40) + (y + 60) = 4y + 120 = 360^\circ$, so $4y = 240^\circ$, $y = \mathbf{60^\circ}$
13. $360^\circ - 270^\circ = \mathbf{90^\circ}$
14. Let adjacent angles be x and $2x$. $x + 2x = 180^\circ$ (since adjacent angles in rhombus are supplementary), so $3x = 180^\circ$, $x = 60^\circ$, $2x = 120^\circ$. Angles: $\mathbf{60^\circ, 120^\circ, 60^\circ, 120^\circ}$
15. The sum of exterior angles of any polygon is 360° . $x = 360^\circ - (80^\circ + 90^\circ + 100^\circ) = 360^\circ - 270^\circ = \mathbf{90^\circ}$