

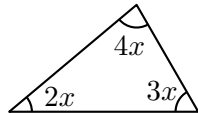
Foundation GCSE: Angles and Two-Dimensional Shapes Problems

Name: _____

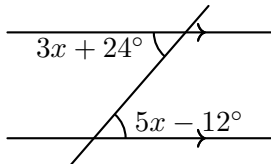
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*Instructions: Answer all questions. Questions are **generally** ordered from easiest (1) to hardest (10). Working out should be shown where appropriate.*

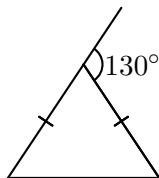
1. A triangle has interior angles $2x$, $3x$, and $4x$. Find the size of the smallest angle.



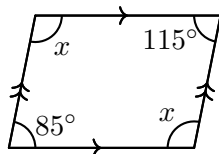
2. Two parallel lines are crossed by a transversal. The alternate angles are $5x - 12^\circ$ and $3x + 24^\circ$ as shown. Find x .



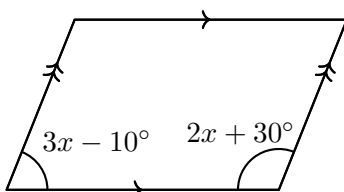
3. In the isosceles triangle, the exterior angle at the vertex is 130° . Find the size of a base angle.



4. Two angles of a quadrilateral are 85° and 115° . The remaining two angles are equal. Find one of the equal angles.



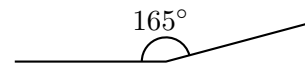
5. In the parallelogram, two consecutive angles are given as $3x - 10^\circ$ and $2x + 30^\circ$. Find x .



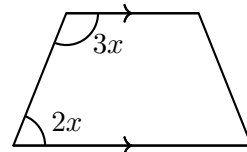
6. An exterior angle of a regular polygon is 24° . Find the number of sides, n .



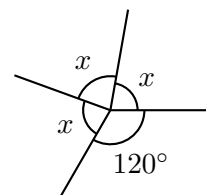
7. A regular polygon has an interior angle of 165° . Find the number of sides, n .



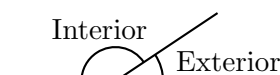
8. In the trapezium, the two angles along the left leg are $3x$ and $2x$. Find x .



9. The diagram shows spokes radiating from the center O of a circular wheel. Three of the angles are equal to x , and the remaining angle is 120° . Find the size of x .



10. The sum of the interior angles of a regular polygon is 900° greater than the sum of its exterior angles. Work out the number of sides, n , of the polygon.



Answers & Worked Solutions

1. 40° : $9x = 180 \implies x = 20$, smallest angle is $2(20) = 40^\circ$.
2. 18: $5x - 12 = 3x + 24 \implies 2x = 36 \implies x = 18^\circ$.
3. 65° : Interior vertex angle $= 180 - 130 = 50^\circ$, base angles $= (180 - 50)/2 = 65^\circ$.
4. 80° : $360 - (85 + 115) = 160^\circ \implies 160/2 = 80^\circ$.
5. 32° : $3x - 10 + 2x + 30 = 180 \implies 5x + 20 = 180 \implies 5x = 160 \implies x = 32^\circ$.
6. 15: $360/24 = 15$ sides.
7. 24° : Exterior $= 180 - 165 = 15^\circ$, $n = 360/15 = 24^\circ$.
8. 36° : $2x + 3x = 180 \implies 5x = 180 \implies x = 36^\circ$.
9. 80° : Angles around a point sum to 360° . Therefore, $3x + 120 = 360 \implies 3x = 240 \implies x = 80^\circ$.
10. 9: The sum of interior angles is $180(n - 2)$ and the sum of exterior angles is always 360° . Setting up the equation: $180(n - 2) = 360 + 900 \implies 180(n - 2) = 1260 \implies n - 2 = 7 \implies n = 9$.