Properties of Geometrical Figures – Question Set

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1. Straight-Line & Vertically Opposite Angles

Q1 Two adjacent angles form a straight line. One angle is $38°$. Find the other.

Q2 Vertically opposite angles at a point are $5x°$ and $3x + 30°$. Solve for x.

Q3 Around a point the angles shown are $112°, 87°, y°$ and $z°$. Find y and z.

2. Parallel Lines

Q4 A transversal cuts two parallel lines. One corresponding angle is $64°$. Find (a) the alternate interior angle, (b) the co-interior angle adjacent to it.

Q5 Lines $p \parallel q$. The angle between the transversal and p on the outside is $3k°$. The alternate interior angle on q is $2k + 20°$. Determine k.

3. Triangles

Q6 Find the third angle of a triangle with angles $53°$ and $67°$.

Q7 In $\triangle ABC$, exterior angle at C is $148°$ and interior angle at A is $62°$. Calculate interior angle at B.

Q8 Triangle XYZ is isosceles with $XY = XZ$ and vertex angle $Y = 46°$. Find the base angles.

4. Quadrilaterals

Q9 Quadrilateral $PQRS$ has three interior angles $92°, 105°, 88°$. Find the fourth.

Q10 A kite has equal sides 9 cm and unequal angles at its apex $54°$. Find each base angle.

5. Regular Polygons

Q11 What is one exterior angle of a regular dodecagon (12-gon)?

Q12 Each interior angle of a regular polygon is $165°$. How many sides does it have?

6. Mixed Reasoning

Q13 The diagram shows two intersecting lines and a pair of parallel lines (information on your copy). Express, in terms of x, the value of the angle marked y. *[Provide your own labelled sketch if required.]*

Q14 Explain why the interior angles of any triangle sum to 180° using a parallel-line argument.

Challenge Question

Q1 A regular n-gon has an interior angle which is three times its exterior angle.

a) Form an equation linking the interior and exterior angles of the polygon and solve for n.

b) Determine the size of each interior and exterior angle.