Angles Basics

Foundation tier | Written solutions

MEASURING AND BASIC ANGLE FACTS

Question 1

Measure each marked arc with a protractor. From left to right the printed angles are approximately 36° (acute), 90° (right), 110° (obtuse), 247° (reflex).

The last arc marks the larger turn. Allow a small measurement tolerance for the printed drawing.

Question 2

Angles on a straight line total 180°. Hence $x + 44° = 180°$, so $x = 136°$.

Question 3

Angles around a point total 360°. Therefore $x = 360° - 280° = 80°$.

TRIANGLES AND QUADRILATERALS

Question 4

The angles in triangle ABC total 180°. Hence $x = 180° - 112° - 34° = 34°$.

Question 5

AC = AB, so the base angles at C and B are equal. Both are 83°.

$x = 180° - 83° - 83° = 14°$.

Question 6

Perpendicular lines make a right angle: 90°. The two parts are 46° and x.

$x = 90° - 46° = 44°$.

Question 7

Interior angles in a quadrilateral total 360°.

Angle ADC $= 360° - 112° - 78° - 82° = 88°$.

Question 8

In isosceles triangle BCD, BC = BD. Its base angles at C and D are (180° − 40°) ÷ 2 = 70°.

Since A, C and D lie on a straight line, angle ACB = 180° − 70° = 110°.

In triangle ABC, angle ABC = 180° − 35° − 110° = 35°.

REASONING WITH ANGLES

Question 9

The marked angles are vertically opposite, so they are equal. x = 120°.

Question 10

The interior angle at C and the 112° exterior angle lie on straight line BCD. Thus angle ACB = 180° − 112° = 68°.

Angles in triangle ABC total 180°, so angle ABC = 180° − 56° − 68° = 56°.

Question 11

The square marks 90°. Angles around the point total 360°.

x = 360° − 43° − 90° − 174° = 53°.

Question 12

These are the four interior angles of a quadrilateral, which total 360°.

x = 360° − 72° − 36° − 90° = 162°. Use the given values: the sketch is not drawn to scale.

Question 13

Angle ACB is a right angle, 90°. The three angles in triangle ABC total 180°.

Angle ABC = 180° − 90° − 30° = 60°.

Question 14

Every angle in an equilateral triangle is 60° (three equal angles add to 180°).

Angle ACB = 60°.

Question 15

The three adjacent angles labelled x make a straight angle: 3x = 180°.

x = 180° ÷ 3 = 60°.

Question 16

a) Opposite angles of a parallelogram are equal, so x = 110°.

b) Neighbouring angles of a parallelogram add to 180°, so y = 180° − 110° = 70°.

Question 17

The left and right angles of this kite are equal, so the left angle is also 120°. Interior angles in a quadrilateral total 360°.

x = 360° − 120° − 120° − 22° = 98°.