

SUBJECT: Maths

UNIT: Year 10 Angles



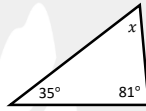
Key Concept

Angle facts:

- Right Angle = 90°
- Straight Line = 180°
- Full Turn = 360°
- Triangle = 180°
- Quadrilateral = 360°
- Sum of exterior angles in any polygon = 360°
- Sum of angles in any polygon = $(n-2) \times 180^\circ$
*where n is the number of sides

Examples

Calculate the size of the angle labelled x .



$$\begin{aligned} 35^\circ + 81^\circ &= 116^\circ \\ 180^\circ - 116^\circ &= 64^\circ \\ x &= 64^\circ \end{aligned}$$

- Step 1.** Add the known angles together.
- Step 2.** Subtract from 180° because it's a triangle.

Key Concepts

When using a protractor, follow these steps:

- Step 1.** Centre the crosshair on the corner of the angle.
- Step 2.** Match the zero-line with one line of the angle.
- Step 3.** Identify whether your line matches the zero on the inside or outside scale of the protractor.
- Step 4.** Follow that scale (inside/outside) until you meet the other line of the angle.



Key Concept

- Corresponding** angles are equal.
- Alternate** angles are equal.
- Co-interior** angles add to 180° .
- Vertically Opposite** angles are equal.

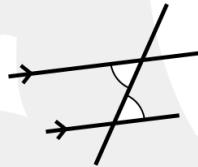
Key Words

- Corresponding:** Angles in the same location at different intersections of the parallel and transversal lines.
- Alternate:** Angles between the parallel lines, but on different sides of the transversal line.
- Co-interior:** Angles between the parallel lines, but on the same side of the transversal line.
- Vertically Opposite:** Angles directly opposite each other at the same point of intersection.

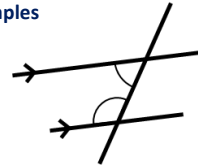
Examples



Corresponding



Alternate



Co-interior



Vertically Opposite

UNIT: Year 10 Algebra



Key Concept

The equation of any straight line is given in the form:

$$y = mx + c$$

Where m is the **gradient** of the line (the slope)

And c is the **y-intercept** of the line (where the line crosses over the y-axis)

Examples

When expanding brackets, there are two variations, single and double brackets.

$$3(x + 5) = 3x + 15 \quad (x + 7)(x + 4)$$

In this method, multiply both terms inside the bracket by the term on the outside as shown by the arrows.

$$\begin{array}{r|l} x & 7 \\ \hline x & x^2 \quad 7x \\ 4 & 4x \quad 28 \\ \hline & = x^2 + 11x + 28 \end{array}$$

Key Concepts

When simplifying algebra, collect terms that have exactly the same variables:

$$3a + 5a = 8a \quad \text{as both terms have the same variable, "a".}$$

$$5bc + 7bc = 12bc \quad \text{as both terms have the same variable "bc".}$$

However, $6a + 5b$ cannot be simplified, as both terms have different variables.

Key Concept

$15x$ and 20 both have a common factor of 5 . So if you were asked to **factorise**

$$15x + 20$$

then you would take the factor of 5 outside the brackets and divide both terms by 5 to get $5(3x + 4)$

Key Words

- Expand:** Multiply each term inside the bracket by the term on the outside.
- Simplify:** Collect terms together or condense into a shorter version.
- Factorise:** Find a common factor of two or more terms and divide by this factor (put into brackets).
- Solve:** Find the solution to an equation by doing the inverse operations.

Examples

When solving a linear equation, you must always perform inverse operations (the opposite) to eliminate terms.

$$\begin{array}{l} x + 5 = 12 \\ \ominus 5 \quad \quad \quad \ominus 5 \\ \hline x = 7 \end{array}$$

$$\begin{array}{l} x - 3 = 11 \\ \oplus 3 \quad \quad \quad \oplus 3 \\ \hline x = 14 \end{array}$$

$$\begin{array}{l} 9x = 36 \\ \div 9 \quad \quad \quad \div 9 \\ \hline x = 4 \end{array}$$

$$\begin{array}{l} \frac{x}{2} = 21 \\ \times 2 \quad \quad \quad \times 2 \\ \hline x = 42 \end{array}$$