

## Year 7 Mathematics Core Term 5

| Lines and Angles |                        |  |                                   |
|------------------|------------------------|--|-----------------------------------|
| 1.               | Angle                  | A measure of turn, measured in degrees <sup>o</sup>  | · .                               |
| Types of         | Angles                 |  |                                   |
| 2.               | Acute                  | Acute angles are less than 90°.  | Acute                             |
| 3.               | Right                  | Right angles are exactly 90°.  | Right                             |
| 4.               | Obtuse                 | Obtuse angles are greater than 90° but<br>less than 180°.  | Obtuse                            |
| 5.               | Reflex                 | Reflex angles are greater than 180° but<br>less than 360°.   | Reflex                            |
| Angle R          | ules                   |  |                                   |
| 6.               | Parallel lines         | Straight lines that stay an equal<br>distance apart and if extended will<br>never meet.                |                                   |
| 7.               | Perpendicular<br>lines | Cross at right angles.   | $\checkmark$                      |
| 8.               | Angle Notation         | Can use one lower-case letters, eg. $\theta$ or $x$ .<br>Can use three upper-case letters, eg. $BAC$ . |                                   |
| 9.               | Straight line          | Angles on a straight line add to 180°.   | $A = B$ $A + B = 180^{\circ}$     |
| 10.              | Around a point         | Angles around a point add to 360°.   | $a = b$ $a + b + c = 360^{\circ}$ |

| 11.                    | Vertically<br>opposite         | Vertically opposite angles are equal.                                      |                           |
|------------------------|--------------------------------|--|---------------------------|
| 12.                    | Alternate                      | Alternate angles on parallel lines are equal.                              |                           |
| 13.                    | Corresponding                  | Corresponding angles on parallel lines are equal.                          |                           |
| 14.                    | Co-interior /<br>Supplementary | Co-interior angles between parallel lines add to 180°.                     |                           |
| 15.                    | Triangle                       | Interior angles in a triangle add to 180°.                                 |                           |
| 16.                    | Quadrilateral                  | Interior angles in a quadrilateral add to 360°.                            | A + B + C + D = 360       |
| Types of               | f Triangles                    |  |                           |
| 17.                    | Equilateral                    | Equilateral triangles have 3 equal sides and 3 equal angles (60°).         | 60°<br>60°<br>Equilateral |
| 18.                    | Isosceles                      | Isosceles triangles have 2 equal sides and 2 equal angles.                 | x x<br>Isosceles          |
| 19.                    | Scalene                        | Scalene triangles have no equal sides and no equal angles.                 | Scalene                   |
| 20.                    | Right-angled                   | Right-angled triangles have 1 right angle and can be scalene or isosceles. | Right Angled              |
| Constructing Triangles |                                |  |                           |
| 21.                    | Protractor                     | Equipment used to measure the size of ar                                   | n angle.                  |
| 22.                    | Construct                      | Draw accurately using a ruler and a pair                                   | of compasses.             |

| 23.                  | Constructing<br>Triangles (Side,<br>Side, Side) | <ol> <li>Draw the base of the triangle using a ruler.</li> <li>Open a pair of compasses to the width of one side of the triangle.</li> <li>Place the point on one end of the line and draw an arc.</li> <li>Repeat for the other side of the triangle at the other end of the line.</li> <li>Using a ruler, draw lines connecting the ends of the base of the triangle to the point where the arcs intersect.</li> </ol> |
|----------------------|---|--|
| Polygon              | S   |  |
| 24.                  | Polygon   | A 2D shape with only straight edges.   |
| 25.                  | Regular   | A shape is regular if all the sides and all the angles are equal.  |
| 26.                  | Triangle  | 3-sided polygon.   |
| 27.                  | Quadrilateral                                   | 4-sided polygon.   |
| 28.                  | Pentagon  | 5-sided polygon.   |
| 29.                  | Hexagon   | 6-sided polygon.   |
| 30.                  | Heptagon/Sept<br>agon                           | 7-sided polygon.   |
| 31.                  | Octagon   | 8-sided polygon.   |
| 32.                  | Nonagon   | 9-sided polygon.   |
| 33.                  | Decagon   | 10-sided polygon.  |
| Sequences and graphs |   |  |
| Sequend              |   |  |
| 34.                  | Linear<br>Sequence                              | A number pattern with a common difference.   |
| 35.                  | Term  | Each value in a sequence is called a term.   |
| 36.                  |   |  |

|          | Term-to-term<br>rule                            | A rule which allows you to find the next term in a sequence if you know the previous term.  |
|----------|---|---|
| 37.      | nth term<br>(position-to-<br>term rule)         | A rule which allows you to calculate the term that is in the nth position of the sequence. n refers to the position of a term in a sequence.  |
| 38.      | Finding the nth<br>term of a linear<br>sequence | 1. Find the difference.<br>2. Multiply that by $n$ .<br>3. Substitute $n = 1$ to find out what number you need to add or subtract to get<br>the first number in the sequence.   |
| 39.      | Triangular<br>numbers                           | The sequence which comes from a pattern of dots that form a triangle (1, 3, 6, 10, 15, 21).   |
| 40.      | Fibonacci type<br>sequences                     | A sequence where the next number is found by adding up the previous two terms.  |
| 41.      | Geometric<br>Sequence                           | A sequence of numbers where each term is found by multiplying the previous one by a number called the common ratio, r.  |
| Straight | Line Graphs                                     |   |
| 42.      | Coordinates                                     | Written in pairs. The first term is the x-coordinate (movement across). The second term is the y-coordinate (movement up or down).  |
| 43.      | Linear Graph                                    | The general equation of a linear graph is $y = mx + c$ , where $m$ is the gradient and $c$ is the y-intercept.  |
|          |   | Method 1: Table of Values<br>Construct a table of values to calculate coordinates.  |
| 44.      | Plotting Linear<br>Graphs                       | <ul> <li>Method 2: Gradient-Intercept Method (use when the equation is in the form y = mx + c)</li> <li>1. Plot the y-intercept.</li> <li>2. Using the gradient, plot a second point.</li> <li>3. Draw a line through the two points plotted.</li> </ul>  |
|          |   | Method 3: Cover-Up Method (use when the equation is in the form $ax + by = c$ )<br>1. Cover the x term and solve the resulting equation. Plot this on the $x - axis$ .<br>2. Cover the y term and solve the resulting equation. Plot this on the $y - axis$ .<br>3. Draw a line through the two points plotted. |

| 45. | Gradient | The gradient of a line is how steep it is. The gradient can be positive (sloping upwards) or negative (sloping downwards), |  |
|-----|----------|--|--|
|     |          | <b>Gradient</b> = $\frac{Change in y}{Change in x} = \frac{Rise}{Run}$   |  |



| Transformations |                        |  |
|-----------------|------------------------|--|
| 1.              | Congruent<br>Shapes    | Shapes are congruent if they are identical, i.e. same shape and same size.                                     |
| 2.              | Congruent<br>Triangles | SSS (Side, Side)   |
|                 |                        | RHS (Right angle, Hypotenuse, Side)  |
|                 |                        | SAS (Side, Angle, Side)  |
|                 |                        | ASA (Angle, Side, Angle)   |
| 3.              | Translation            | Translate means to move a shape. The shape does not change size or orientation.                                |
| 4.              | Column<br>Vector       | In a column vector, the top number moves left (-) or right (+) and the bottom number moves up (+) or down (-). |
| 5.              | Rotation               | The size does not change, but the shape is turned around a point.  |
| 6.              | Reflection             | The size does not change, but the shape is 'flipped' like in a mirror.   |
|                 |                        | Line $x = ?$ is a vertical line.   |
|                 |                        | Line $y = ?$ is a horizontal line.   |
|                 |                        | Line $y = x$ is a diagonal line.   |
| 7.              | Enlargement            | The shape will get bigger or smaller. Multiply each side by the scale factor.                                  |
| 8.              | Scale Factor           | The ratio of corresponding sides of two similar shapes.  |