Strand 2 Chapter 3 Geometry 1

1. I know that that a **right angle is 90°,** a **straight line angle is 180°,** an **acute angle is between 0° and 90°**, an **obtuse angle between 90° and 180°** and a r**eflex angle is between 180° and 360°**.
2. I know that the **sum of angles on a straight line add to 180°, the sum of angle meeting at a point add to 360°** and that **vertically opposite angles formed when 2 straight lines cross at a point are equal.**
3. I know that angles formed when a **straight line crosses a pair of parallel lines** have the following properties: **corresponding angles are equal**, **alternate angles are equ**al and that the **sum of interior angles adds up to 180°.**
4. I know **that an equilateral triangle has 3 equal sides and 3 equal angles (60**°)
5. I know that an **isosceles triangle has 2 sides equal in length and that the angles opposite the equal sides are equal** (very important rule).
   Example 1 Page 80
6. A **right angled triangle has 1 angle of 90°** and that **Pythagoras** rule can be used in these triangles to find the length of any 3rd side if I know the length of the other 2. $\mathbf{a^2 = b^2 + c^2}$
   Example 2 Page 81
7. I know that t**riangles without any of the above properties are known as scalene triangles.**
8. I know that the **sum of angles in a triangle is 180°.**
9. I know that the **exterior angle in a triangle is equal to the sum of the interior opposite angles.**
10. I know **congruent triangles are the same size and shape** (they are the same). Triangles can be shown to be congruent if they have 3 pairs of sides the same length **'SSS'**, 2 pairs of side lengths are the same length and the angle between the 2 sides is the same **'SAS'**, two pairs of angles are equal and the sides between the 2 equal angles are equal in length **'ASA'** or both triangles have a right angle, the hypotenuses are equal and one pair of corresponding sides are equal in length **'RHS'**.
    EX 3.1 Q2 – Q12 Page 81

11. **I am familiar with Theorem 7**
    <u>Theorem 4 The angle opposite the greater of 2 sides is greater than the angle opposite the lesser side.</u>

    And that

    <u>Converse of theorem states that the side opposite the greater of the two angles is longer than the side opposite the lesser side.</u>

12. I know that for a triangle...triangle inequality...

<u>Theorem 8 Two sides of a triangle are together greater than the third side</u>

13. I know that the **area of a triangle** can be found by multiplying ½ the chosen base side by the perpendicular height to that base side. **A = ½ |base|X Perp Height.**

<u>THEOREM 16 For any triangle, base height does not depend on the choice of base</u> (but make sure you use the height that is perpendicular to that chosen base)

14. I know these properties of a parallelgram:

- **Opposite sides in a parallelogram are congruent**
- **Opposite angles in a parallelogram are congruent**
- **I know that consecutive angles add to 180° (supplementary..add to 180°)**
- **If one angle in a parallelogram is a right angle..all angles are right angles**
- **Diagonals in a parallelogram bisect each other**
- **Diagonals in a parallelogram bisect the parallelogram into 2 congruent triangles of equal area.**

15. I know that

<u>Theorem 17 A diagonal of a parallelogram bisects the area.</u>

<u>and</u>

<u>Theorem 18 The area of a parallelogram is the base multiplied by the perpendicular height.</u>

Example 1 Page 85

16. I know that Parallelograms (or triangles) with the same base and between the same parallel lines are equal in area.

Ex 3.2 Q1 – Q13 Odd Page 86

17. I know that

<u>Theorem 12 A line drawn parallel to one side of a triangle divides the other two sides in the same ratio.</u>

Example 1 Page 89

18. **I know to place the side I am looking for in the top left of my equation when solving problems associated with these.**

19. I know that **for transversals....**

<u>Theorem 11 If three parallel lines cut off 2 equal segments on some transversal line, they will cut off 2 equal segments on any other transversal.</u>

Note: that the **RATIO** of the 2 segments cut on the first transversal will be the same as the **RATIO** of the 2 segments cut off on the second transversal. This means that the 2 segments are not necessarily always equal to each other in length.

Example 2 Pg 90

20. I know that similar triangles are **'equiangular'** in that have 2 angles in one triangle are equal to 2 angles the other.

21. I know that **similar triangles are not neces**sarily the SAME size.

22. I know that in similar triangles...**the corresponding sides are those sides opposite the same angles.**

And that

<u>Theorem 13 If two triangles are similar then their corresponding sides are proportional, in order</u>

SEE Formula Page 91 and Example 3 Page 91
Ex 3.3 Q1 – Q21 Odd Page 92

23. I know that it is important to look out for **isosceles triangle made up of radii** in circle geometry problems.

Circles

24. I know for Circles that the angle in a semicircle is a right angle...

25. I know that a tangent to a circle is a straight line which meets the circle at one point only.
26. I know that the chord of a circle is a line inside the circle which cuts the circle at 2 points and that

<u>Circle Theorem 21 The perpendicular drawn from the centre of a circle to a chord bisects that chord.</u>
Example 1 Page 96

27. I know that

<u>Circle Theorem 20 A tangent is perpendicular to the radius that goes (from the centre) to the (tangent) point of contact.</u>

28. I know that

<u>Circle Theorem 20 If a point P lies on a circle k, and a line l is perpendicular to the radius to P, then l is a tangent to k.</u>
Ex ample 2 Page 97

Angles in Circles

29. I know that **the angle subtended at the centre of a circle is twice the angle at the circumference**

Corollary 1 Angles at the circumference on the same arc are equal in measure
Corollary 2 The sum of the opposite angles of a cyclic quadrilateral is 180**°**

Corollary 6 If two circles intersect at one point only, then the two centres and the point of contact are collinear.

(A corollary is a statement attached to a theorem which has been proven and follows obviously from it)

Example 3 Page 98
Ex 3.4 Q2 – Q24 Even Page 99