

Level 1 Geometry Review Topics

Don't fret too much about formulae: many will be given on the final

- Logic – If-then, inverse, converse, and contrapositive
- Complementary and Supplementary Angles
- Vertical Angles
- Congruent Triangles – ASA, SAS, SSS, AAS, HL, (not SSA!), CPCTC
- Altitudes, Medians, and Angle Bisectors of triangles
- Types of triangles – Right, Obtuse, Acute, Scalene, Isosceles, Equilateral
- Isosceles Triangles – Base Angles Theorem
- Exterior Angles
- Coordinate Geometry – Slope, Distance Formula, Midpoint Formula
- Parallel Lines – Alternate Interior Angles, Corresponding Angles, Same-side Interior, Alternate Exterior Angles, Same-side Exterior Angles.
- Quadrilaterals – parallelogram, rectangle, rhombus, square, kite, trapezoid
- Properties of quadrilaterals
- Sum of interior angles of a triangle = 180°
- Sum of exterior angles of any polygon = 360°
- Sum of interior angles of any polygon = $(n-2) 180^\circ$
- No Choice Theorem
- Names of polygons – pentagon, hexagon, etc.
- Regular Polygons
- Proportions
- Similar Triangles – AA Similarity, SAS Similarity, SSS Similarity
- Side-splitter theorem
- Midline Theorem
- Geometric Mean with Right Triangles
- Pythagorean Theorem
- Pythagorean Triples
- Special Right Triangles – 30-60-90, 45-45-90
- Pythagorean Theorem in 3-D Figures
- Trigonometry – Sine, Cosine, and Tangent, SOH CAH TOA
- Circles – central angles, inscribed angles, secants, tangents, chords
- Areas and Volumes
- Transformations – reflection, translation, rotation, and dilation

Level 1 Geometry Review 1: Angles and Polygons

Note to students: Please pardon the strange numbering; I have taken material from other teachers and shortened it to fit the time we have. As always, please email me with questions.

Polygon angle formulas - Let n = the number of sides in a polygon.

The sum of the interior angles in any n -gon: $(n - 2) 180^\circ$

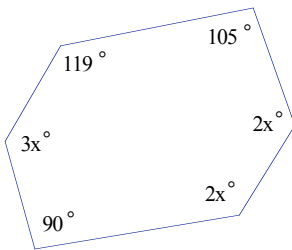
One interior angle in a regular n -gon: $\frac{(n - 2)180^\circ}{n}$

The sum of the exterior angles in any n -gon: 360°

The measure of an exterior angle in a regular n -gon: $\frac{360^\circ}{n}$

2. What is the sum of the interior angles of a 40 sided polygon?

3. Given the angles shown in this polygon, find the value of x .



4. Given a regular 90-gon how large is each exterior angle?

6. Suppose a regular polygon has exterior angles of size 0.5° . How many sides are there?

10. In a regular polygon each interior angle is 170° larger than each exterior angle.
How many sides are there?
12. The angles of a triangle are in the ratio of 5:5:6. Find the angles.
15. Half the complement of an angle when added to one quarter of the angle makes 32.5° .
Find the angle and its complement.
16. Two sides of a triangle are of lengths 5 and 14. What are all the possible lengths for the third side?

Level 1 Geometry Review 2: Congruent Triangles

1. Vertical angles are congruent.
2. Base Angles Theorem – If 2 sides of a triangle are congruent, then the opposite angles are congruent. And its converse – If 2 angles of a triangle are congruent then the opposite sides are congruent.
3. Proving triangles congruent: ASA, SAS, SSS, AAS, and HL (Not SSA!)
4. **Properties of parallelograms**
 - Opposite sides are parallel
 - Opposite sides are congruent
 - Opposite angles are congruent
 - Diagonal bisect each other
5. **Properties of rectangles**
 - All properties of a parallelogram
 - All angles are right.
 - Diagonals are congruent.
6. **Properties of a rhombus**
 - All properties of a parallelogram
 - All sides are congruent.
 - Diagonals are perpendicular.
 - Diagonals bisect opposite angles.
7. **Properties of a square**
 - All properties of a rectangle
 - All properties of a rhombus
8. **Properties of an isosceles trapezoid**
 - One pair of opposite sides parallel
 - Legs are congruent.
 - Base angles are congruent.
 - Diagonals are congruent.
9. Besides the properties, you can prove that a quadrilateral is a parallelogram by proving that one pair of opposite sides are both congruent and parallel.

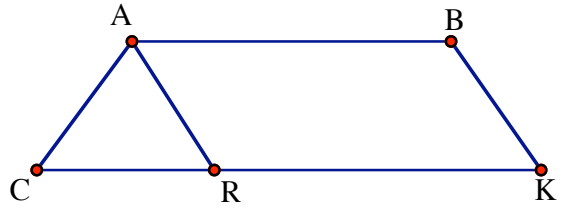
Problems

$$\overline{AC} \cong \overline{AR}$$

2. Given: $\overline{AC} \cong \overline{BK}$

$$\angle C \cong \angle K$$

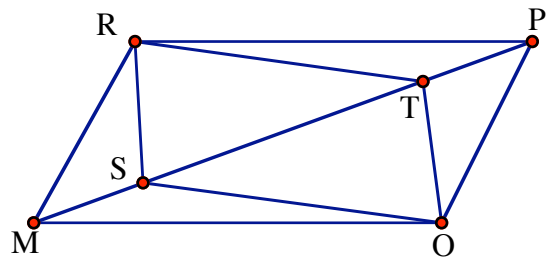
Prove: BARK is a parallelogram.



4. Given: RSOT is a parallelogram.

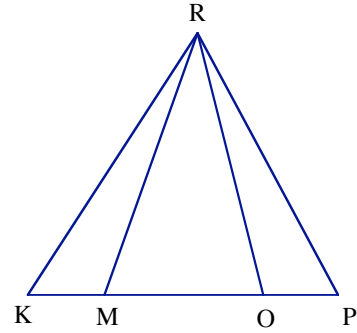
$$\overline{MS} \cong \overline{TP}$$

Prove: MOPR is a parallelogram.



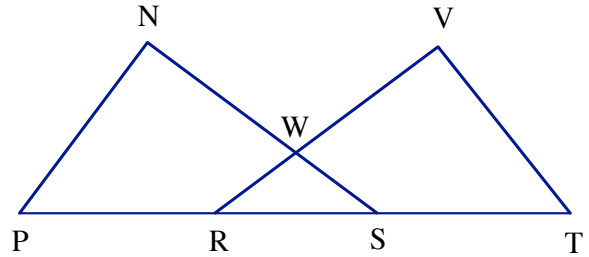
6. Given: $\angle KRM \cong \angle PRO$
 $\overline{KR} \cong \overline{PR}$

Prove: $\overline{RM} \cong \overline{RO}$



8. Given: $\overline{PR} \cong \overline{ST}$
 $\overline{NP} \cong \overline{VT}$
 $\angle P \cong \angle T$

Prove: $\triangle WRS$ is isosceles.



9. Given: $\overline{FG} \cong \overline{JH}$
 $\angle FGH \cong \angle JHG$

Prove: $\triangle FKJ$ is isosceles.

