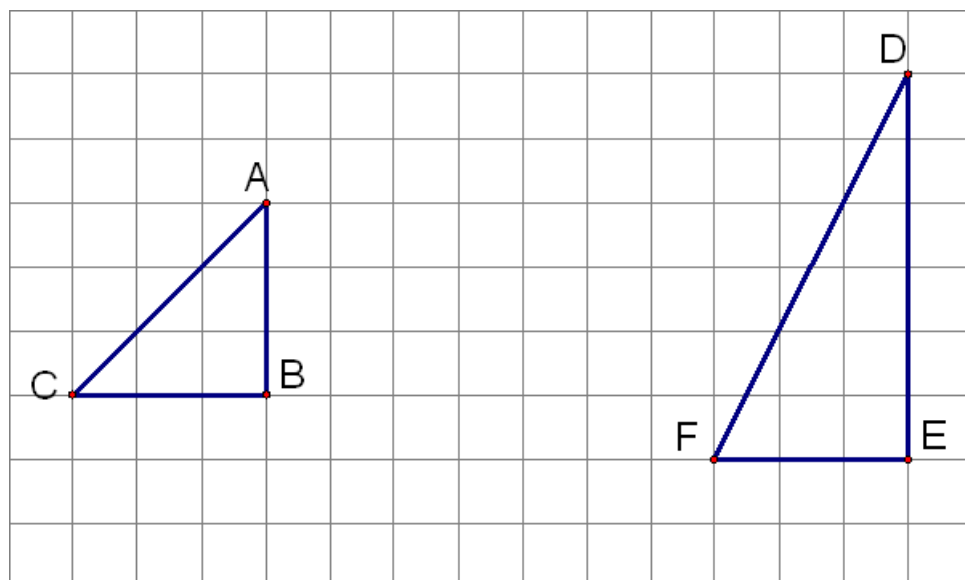# Grade 8 Mathematics Worksheet

Properties of geometric figures and shapes

Questions:

1. Create two different quadrilaterals by making use of two given different triangles (Right angled isosceles triangle and a right angled scalene triangle) and fill out the table below.

| Parent triangle	Quadrilateral formed through reflection	Sides of quadrilateral	Angles of quadrilateral	Diagonals	Lines of symmetry
Right angled isosceles triangle					
Right angled scalene triangle					

Grade 8 Mathematics Worksheet

2.   What are the differences and the similarities between the two quadrilaterals?
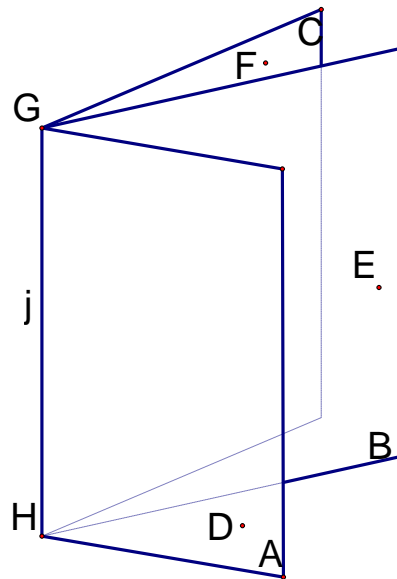
Quadrilateral	Square ……………………	Rhombus ………………
Differences		
Similarities		

3.   The two parallel lines below divide the plane into   ……………….. parts.
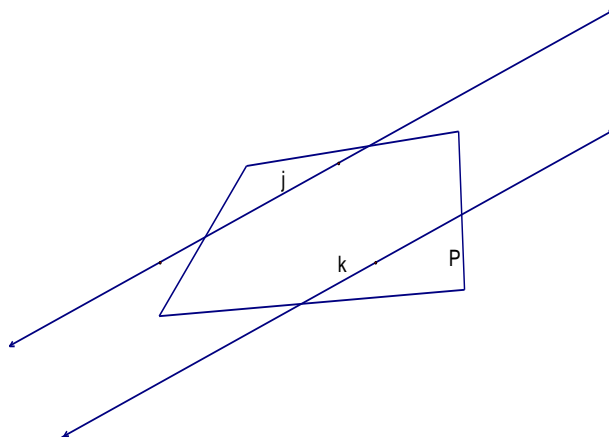

4.   Look at the diagram below of three planes A and B and C and answer the questions.
   i)   Which <u>two points</u> lie in plane A, B and C repectively?
   ii)   Which <u>three points</u> lie in plane A, B and C repectively?
   iii)   The three planes A, B and C pass through a common line …………………………

We can also say that:

iv)   If two points of a line lie in a given plane, then …………….. point of the line lies in this plane.

v)   Through every three points not lying on the same line, you can draw a ……………. and such a ……………. is unique.

vi)   A plane can be rotated about every line lying in this …………………

5.   i)   Line segment CD, that lies in plane E, is parallel to line segment AB in plane F, therefore line segment CD is ……………………….. to plane F
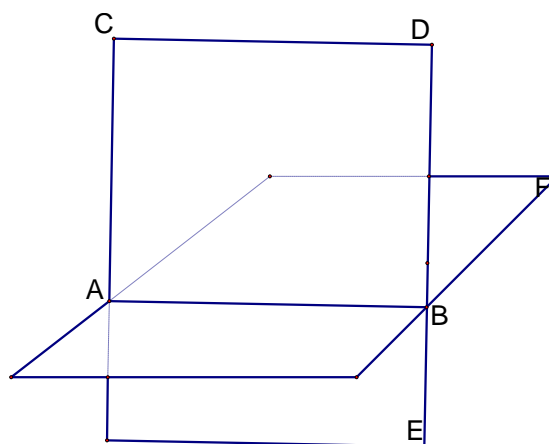
ii) If two parallel planes E and B are intersected by a third plane F, the intersecting lines KL and MN are: ……………………..
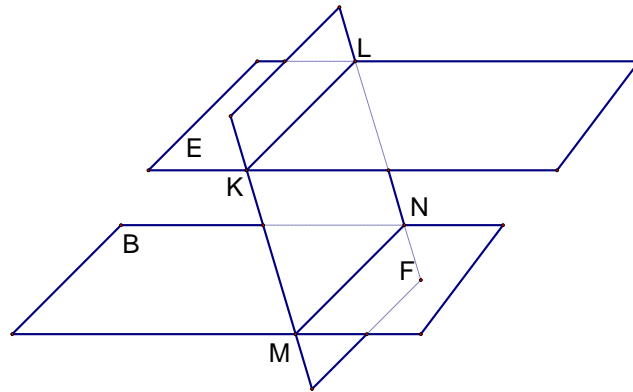
6. Take a careful look at the diagram below and answer all the questions. In this diagram line segment EA is perpendicular to plane K in point A.
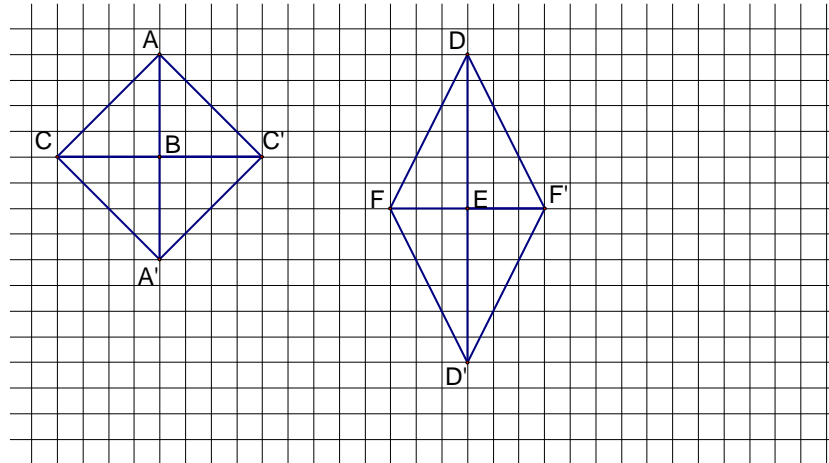
i) Name all the other line segments that EA is perpendicular to.
ii) Name all the oblique or slant line segments in this diagram.
iii) Name all the projections to every slant identified above in this diagram.
iv) Another name for the slants in this diagram can also be the ………………. of the respective triangles.
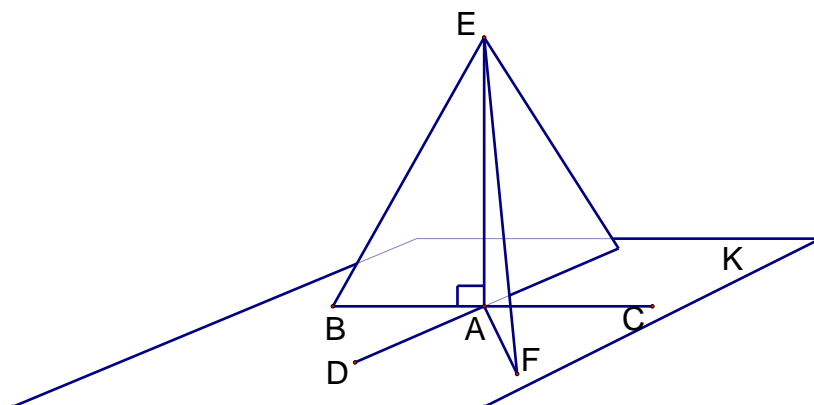
Solution

1.

	Square	Rhombus	Kite
Sides:			
All sides congruent	√	√	
Opposite sides congruent	√	√	
Consecutive sides congruent	√	√	√
Opposite sides parallel	√	√	
Consecutive sides perpendicular	√		
Vertex Angles:			
All angles congruent (90⁰)	√		
Opposite angles congruent	√	√	
Consecutive angles supplementary	√	√	
Vertex angles bisected by diagonals (one pair/both pairs)	√ both	√ Both	√ one
Diagonals:			
Congruent to one	√		

another			
Bisect one another (one/both)	√ both	√ Both	√ one
Perpendicular to one another	√	√	√
Perpendicular bisectors of one another (one/both)	√ both	√ Both	√ one
Bisect vertex angles (one pair/both pairs)	√ both	√ Both	√ one
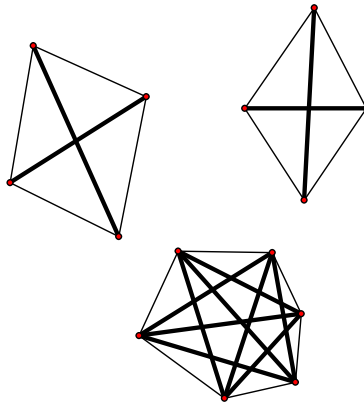
Convex polygons: All diagonals are inside.
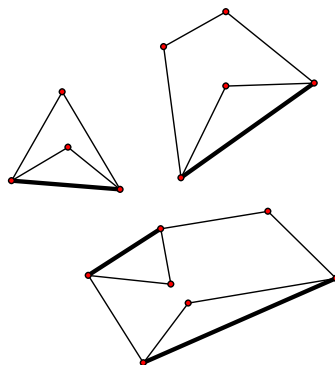
Concave polygons: At least one diagonal is outside.

2.

Quadrilateral	Square ……………………	Rhombus ………………
Differences	Diagonals bisect <u>equally</u> All <u>angles</u> are equal 4 lines of symmetry	Diagonals bisect <u>not equally</u> <u>Opposite angles</u> are equal 2 lines of symmetry
Similarities	Shape is a quadrilateral All 4 sides are equal Diagonals bisect perpendicularly Diagonals bisect opposite angles	

3.   Three

4.   i)   H and G
      ii)   A, H and G, B, H and G and C, H and G
      iii) j or GH
      iv)   All
      v)   Plane and such a plane
      vi)   Plane

5.   i)   Parallel
      ii)   Parallel

6.   i)   All the lines that are part of the plane K, DA, BC, AF
      ii)   EB, EF
      iii) AB, AD, AF, Ac
      iv)   Hypotenuse

Learners should have access to the real objects and be allowed to have experiences with the objects in order to define the different relationships of the parts of the objects in terms of their sides, angles, faces vertices and edges.

The relevant terminology should be developed as the need arises for discussing and comparing the different parts. Teachers should be careful to try and teach ready-made definitions. Allow the learners to develop their own definitions based on their

understanding and refine it to a final product at the end of a long period of investigation through physical manipulation and discussions.

At this phase learners should be able to compare and discuss the relevant differences between different classes of objects (e.g. Difference between a rhombus and a square, prism and a pyramid etc.)

The representation and introduction of terms related to solid objects should be carefully negotiated. Many of the concepts related to solid objects poses a conflict when represented on paper (e.g. skew lines looks as if they actually intersect on paper).