Grade 7 Maths Worksheet

Assessment Task: Construction of polygons

Questions:

1. Construct a square ABCD with side lengths of 6 cm.

2. Construct an isosceles triangle DEF with the two equal sides the length of 6 cm.

3. Construct an equilateral triangle TUV with side lengths of 6 cm.

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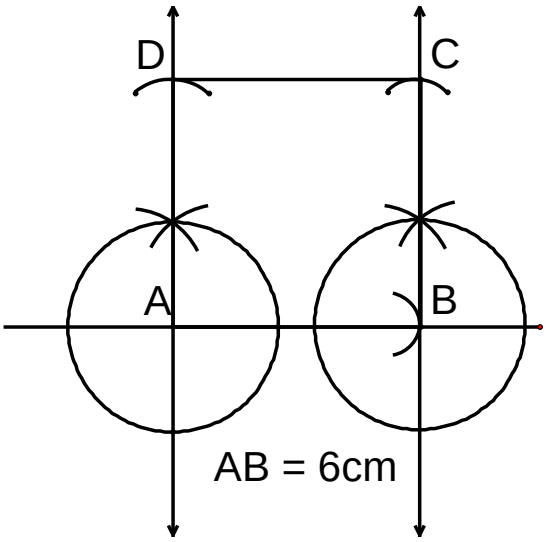
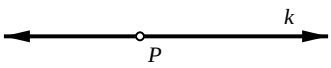
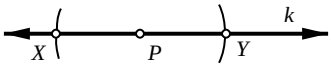
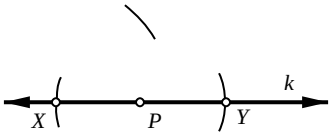
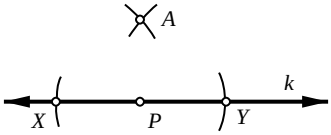
Solution

1.



Instructions to construct the 90 degree angle. (For the construction of a square, four different 90 degree angles need to be constructed.)

1. Begin with line *k*, containing point *P*.	
2. Place the compass on point *P*. Using an arbitrary radius, draw arcs intersecting line *k* at two points. Label the intersection points *X* and *Y*.	
3. Place the compass at point *X*. Adjust the compass radius so that it is more than (½) *XY*. Draw an arc as shown here.	
4. Without changing the compass radius, place the compass on point *Y*. Draw an arc intersecting the previously drawn arc. Label the intersection point *A*.	

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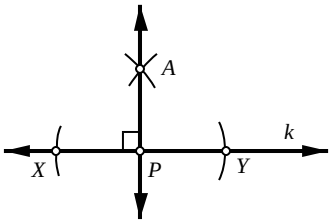
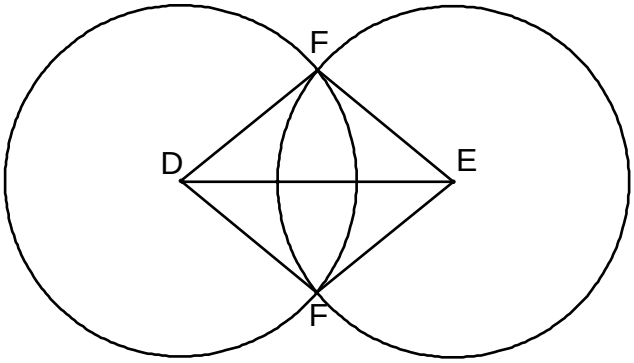
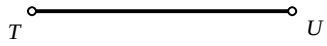
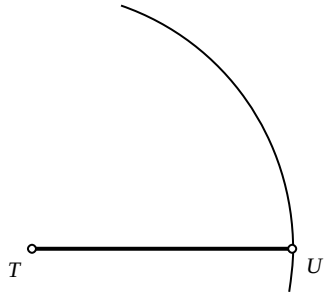
5. Use the straight edge to draw line *AP*. Line *AP* is perpendicular to line *k*.	

2. Draw a line segment DE of any length (not longer than 6 cm). Set the radius of the compass on 6 cm and construct a circle with midpoint E. Keep the radius of the compass on 6 cm and construct a circle with midpoint D. The position where the two circles intersect is F. It can be on any side of the line segment DE.



3.

1. Begin with line segment *TU* = 6 cm.	
2. Centre the compass at point *T*, and set the compass radius to *TU*. Draw an arc (6cm radius) as shown.	

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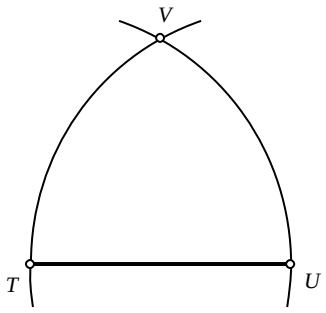
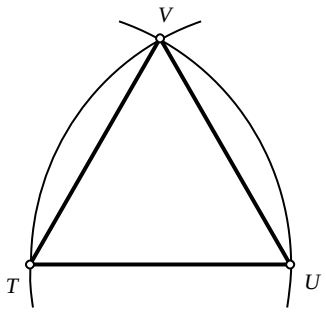
3. Keeping the same radius (6 cm), centre the compass at point *U* and draw another arc intersecting the first one. Let point *V* be the point of intersection.	
4. Draw line segments *TV* and *UV*. Triangle *TUV* is an equilateral triangle, and each of its interior angles has a measure of 60^0.	

The actual construction of objects as a way to investigate the properties of a figure forms the basis of these activities. Be careful to introduce the constructions with a compass not in a mechanical way but as a tool for discussing relationships of shapes.

Pre knowledge to these activities are the fact that a circle is created by a continuous "pathway" or locus created by a moving point equidistance from a fixed centre, This implies that a radius is used with a fixed distance or length.

Appendix of Assignment Tools

Constructions
Visualisation
Reasoning with proportions
Reasoning with continuous change
Proof reasoning
Defining