1. Geometrical Constructions
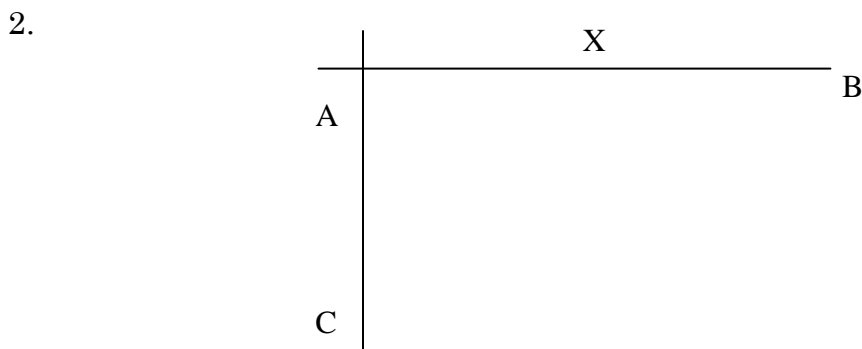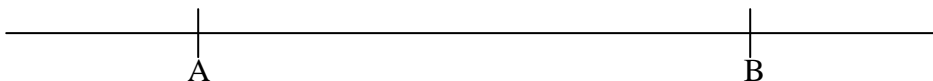
1. Using a ruler and a pair of compasses only,

   a)   Construct a triangle ABC in which AB = 9cm, AC = 6cm and angle BAC = $37\frac{1}{2}^0$

   a) Drop a perpendicular from C to meet AB at D. Measure CD and hence find the area of the triangle ABC

   b) Point E divides BC in the ratio 2:3. Using a ruler and Set Square only, determine point E. Measure AE.

2.

   On the diagram, construct a circle to touch line AB at X and passes through the point C.

   (3 mks)

3. Using ruler and pair of compasses only for constructions in this question.

   (a) Construct triangle ABC such that AB=AC=5.4cm and angle ABC=30^0. Measure BC

   (4 mks)

   (b) On the diagram above, a point P is always on the same side of BC as A. Draw the locus of P such that angle BAC is twice angle BPC   (2 mks)

   (c) Drop a perpendicular from A to meet BC at D. Measure AD   (2 mks)

   (d) Determine the locus Q on the same side of BC as A such that the area of triangle BQC = 9.4cm²   (2 mks)

4. (a) Without using a protractor or set square, construct a triangle ABC in which AB = 4cm,   BC = 6cm and ∠ABC = $67\frac{1}{2}^0$. Take AB as the base.   (3mks)

   Measure AC.

   (b) Draw a triangle A^1BC^1 which is indirectly congruent to triangle ABC.   (3mks)

   (c) Taking the mid point of AB as your centre of rotation (M). Find the triangle $A^{11}B^{11}C^{11}$ the image of $A^1B^1C^1$ after -90^0.   (4mks)

5. Construct triangle ABC in which AB = 4.4 cm, BC = 6.4 cm and AC = 7.4 cm. Construct an escribed circle opposite angle ACB   (5 mks)

   (a) Measure the radius of the circle   (1 mk)

   (b) Measure the acute angle subtended at the centre of the circle by AB (1 mk)

(c) A point P moves such that it is always outside the circle but within triangle AOB, where O is the centre of the escribed circle. Show by shading the region within which P lies. (3 mks)

6. (a) Using a ruler and a pair of compasses only, construct a parallelogram PQRS in which PQ = 8cm, QR = 6cm and $\angle$ PQR = 150^0 (3 mks)

(b) Drop a perpendicular from S to meet PQ at B. Measure SB and hence calculate the area of the parallelogram. (5 mks)

(c) Mark a point A on BS produced such that the area of triangle APQ is equal to three quarters the area of the parallelogram (1 mk)

(d) Determine the height of the triangle. (1 mk)

7. Using a ruler and a pair of compasses only, construct triangle ABC in which AB = 6cm, BC = 8cm and angle ABC = 45°. Drop a perpendicular from A to BC at M. Measure AM and AC (4mks)

8. a) Using a ruler and a pair of compasses only to construct a trapezium ABCD such that $AB = 12cm$, $\angle DAB = 60^0$, $\angle ABC = 75^0$ and $AD = 7cm$ (5mks)

b) From the point D drop a perpendicular to the line AB to meet the line at E. measure DE hence calculate the area of the trapezium (5mks)

9. Using a pair of compasses and ruler only;
(a) Construct triangle ABC such that AB = 8cm, BC = 6cm and angle ABC = 30^0. (3 marks)
(b) Measure the length of AC (1 mark)
(c) Draw a circle that touches the vertices A,B and C. (2 marks)
(d) Measure the radius of the circle (1 mark)
(e) Hence or otherwise, calculate the area of the circle outside the triangle. (3 marks)

10. Using a ruler and a pair of compasses only, construct the locus of a point P such that angle APB = 60^0 on the line AB = 5cm. (4mks)

11. Using a set square, ruler and pair of compases divide the given line into 5 equal portions. (3mks)

12. Using a ruler and a pair of compasses only, draw a parallelogram ABCD, such that angle DAB = 75^0. Length AB = 6.0cm and BC = 4.0cm from point D, drop a perpendicular to meet line AB at N
a) Measure length DN

b) Find the area of the parallelogram   (10 mks)

13.   Chebochok deposited shs.120,000 in a financial institution which offered a compound
       interest at 8% p.a, compounded quarterly for 9 months. Find the accumulated amount by
       the end of the period

14.   Using a ruler and a pair of compasses only, draw a parallelogram ABCD in which AB = 6cm,
       BC = 4cm and angle BAD = 60°. By construction, determine the perpendicular distance between
       the lines AB and CD

15.   Without using a protractor, draw a triangle ABC where $\angle CAB = 30^\circ$, AC = 3.5cm and
       AB = 6cm. measure BC

16.   (a) Using a ruler and a pair of compass only, construct a triangle ABC in which
            angle ABC =37.5°, BC =7cm and BA = 14cm
        (b) Drop a perpendicular from A to BC produced and measure its height
        (c) Use your height in (b) to find the area of the triangle ABC
       (d) Use construction to find the radius of an inscribed circle of triangle ABC

17.   In this question use a pair of compasses and a ruler only
       a) Construct triangle PQR such that PQ = 6 cm, QR = 8 cm and <PQR = 135°
       b) Construct the height of triangle PQR in (a) above, taking QR as the base

18.   On the line AC shown below, point **B** lies above the line such that $\angle BAC = 52.5^\circ$ and]
        AB = 4.2cm.   (***Use a ruler and a pair of compasses for this question***)

       ⊢――――――――――――――――――――――――――――⊢――――――
       A   C
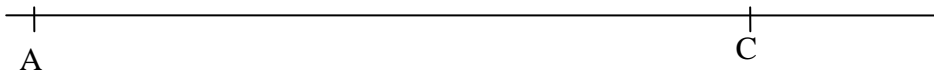
       (a) Construct $\angle BAC$ and mark point **B**
        (b) Drop a perpendicular from **B** to meet the line **AC** at point **F**. Measure **BF**

19.   Juma paid shs.450 for a trouser after getting a discount of 10%. The trader still made a
profit of 25% on the sale. What profit would the trader have made if no discount was allowed?