

FORM 2; MEASUREMENTS

KCSE QUICK REVISION

*Compilation of Possible Questions in Mathematics Likely to be examined in
KCSE.*

*A Special Analysis of Prediction Questions that may be Tested in KCSE from this
Topic in Form 2.*

MATHEMATICS

SERIES 1

For Marking Schemes

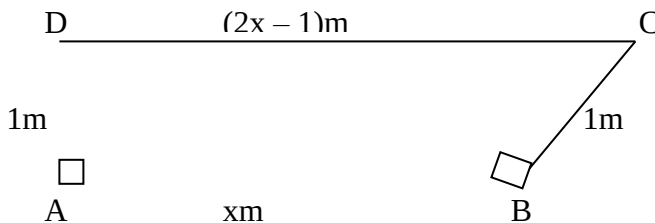
Mr Isaboke 0746 222 000 / 0742 999 000

MWALIMU CONSULTANCY

MEASUREMENT

1. A solid cone of height 12 cm and radius 9 cm is recast into a solid sphere. Calculate the surface area of the sphere.
2. A circular path of width 14 metres surrounds a field of diameter 70 metres. The path is to be carpeted and the field is to have a concrete slab with an exception of four rectangular holes each measuring 4 metres by 3 metres.
A contractor estimated the cost of carpeting the path at Kshs. 300 per square metre and the cost of putting the concrete slab at Kshs 400 per square metre. He then made a quotation which was 15% more than the total estimate. After completing the job, he realized that 20% of the quotation was not spent.
 - (a) How much money was not spent?
 - (b) What was the actual cost of the contract?
3. In the figure below BAD and CBD are right angled triangles.

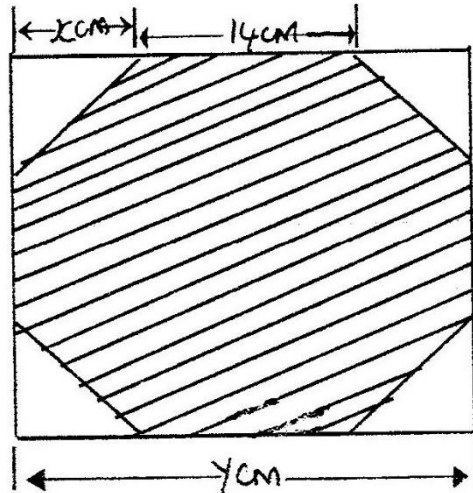
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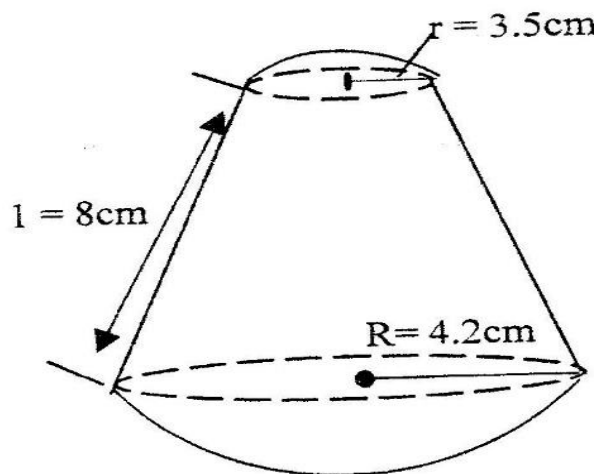
Find the length of AB.

4. A cylinder of radius 14 cm contains water. A metal solid cone of base radius 7 cm and height 18 cm is submerged into the water. Find the change in height of the water level in the cylinder.
5. A cylindrical container of radius 15 cm has some water in it. When a solid is submerged into the water, the water level rises by 1.2 cm.
 - (a) Find, the volume of the water displaced by the solid leaving your answer in terms of π
 - (b) If the solid is a circular cone of height 9 cm, calculate the radius of the cone to 2 decimal places.

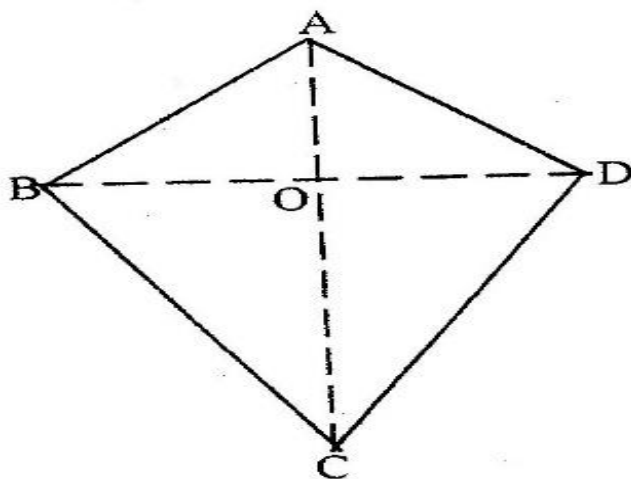
6. A balloon, in the form of a sphere of radius 2 cm, is blown up so that the volume increases by 237.5%. Determine the new volume of balloon in terms of Π
7. A girl wanted to make a rectangular octagon of side 14 cm. She made it from a square piece of a card of size y cm by cutting off four isosceles triangles whose equal sides were x cm each, as shown below.



- (a) Write down an expression for the octagon in terms of x and y
- (b) Find the value of x
- (c) Find the area of the octagon
8. A pyramid $VABCD$ has a rectangular horizontal base $ABCD$ with $AB = 12$ cm and $BC = 9$ cm. The vertex V is vertically above A and $VA = 6$ cm. Calculate the volume of the pyramid.
9. A solid made up of a conical frustum and a hemisphere top as shown in the figure below. The dimensions are as indicated in the figure.

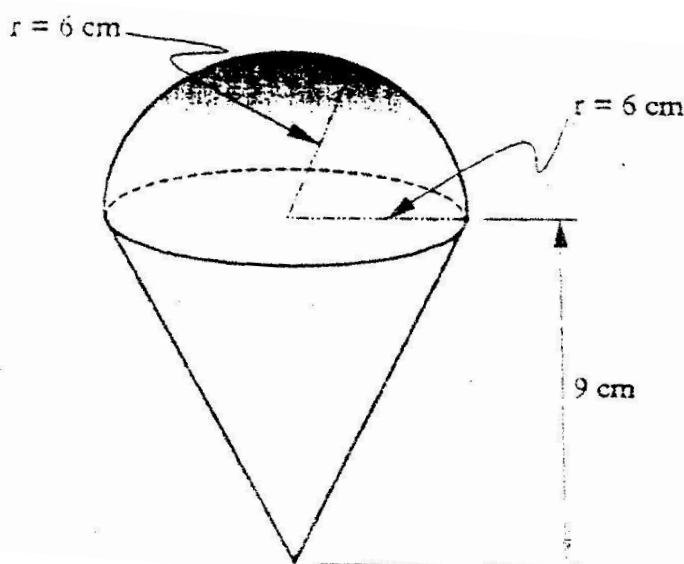


- (a) Find the area of
- (i) The circular base
 - (ii) The curved surface of the frustrum
 - (iii) The hemisphere surface
- (b) A similar solid has a total area of 81.51 cm^2 . Determine the radius of its base.
- 10.** Two sides of triangles are 5 cm each and the angle between them is 120° . Calculate the area of the triangle.
- 11.** The figure below represents a kite ABCD, $AB = AD = 15 \text{ cm}$. The diagonals BD and AC intersect at O. $AC = 30 \text{ cm}$ and $AO = 12 \text{ cm}$.



Find the area of the kite

- 12.** The diagram below represents a solid made up of a hemisphere mounted on a cone. The radius of the hemisphere are each 6 cm and the height of the cone is 9 cm.

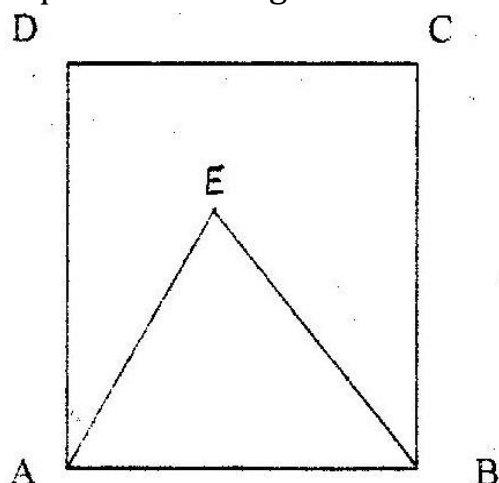


Calculate the volume of the solid take $\pi = \frac{22}{7}$

- 13.** The internal and external diameters of a circular ring are 6 cm and 8 cm respectively. Find the volume of the ring if its thickness is 2 millimeters.

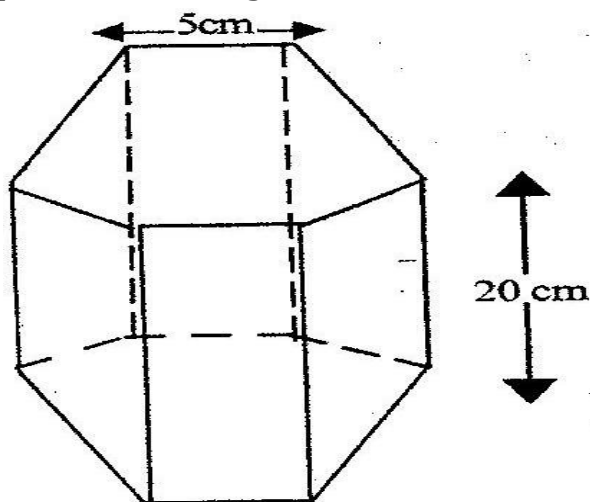
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- 14.** A wire of length 21 cm is bent to form the shape down in the figure below, ABCD is a rectangle and AEB is an equilateral triangle. **(2mks)**



If the length of AD of the rectangle is $1\frac{1}{2}$ times its width, calculate the width of the rectangle.

- 15.** The length of a hollow cylindrical pipe is 6 metres. Its external diameter is 11 cm and has a thickness of 1 cm. Calculate the volume in cm^3 of the material used to make the pipe. Take π as 3.142.
- 16.** The figure below represents a hexagon of side 5 cm and 20 cm height



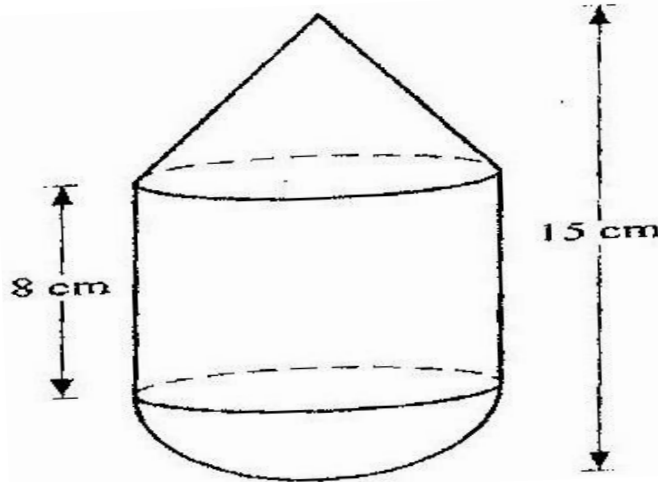
Find the volume of the prism.

- 17.** A cylindrical piece of wood of radius 4.2 cm and length 150 cm is cut length into two equal pieces.

Calculate the surface area of one piece

(Take π as $\frac{22}{7}$)

- 18.** The figure below is a model representing a storage container. The model whose total height is 15 cm is made up of a conical top, a hemispherical bottom and the middle part is cylindrical. The radius of the base of the cone and that of the hemisphere are each 3 cm. The height of the cylindrical part is 8 cm.



- (a) Calculate the external surface area of the model
- (b) The actual storage container has a total height of 6 metres. The outside of the actual storage container is to be painted. Calculate the amount of paint required if an area of 20m^2 requires 0.75 litres of the paint.

- 19.** A garden measures 10m long and 8 m wide. A path of uniform width is made all round the garden. The total area of the garden and the paths is 168 m^2 .

(a) Find the width of the path

- (b) The path is to be covered with square concrete slabs. Each corner of the path is covered with a slab whose side is equal to the width of the path.

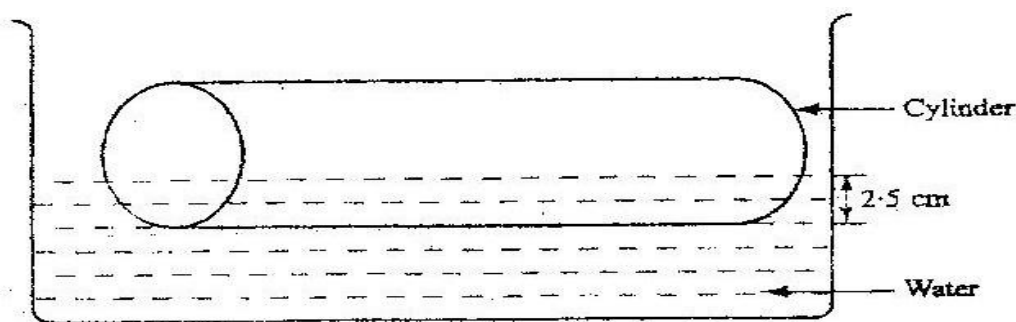
The rest of the path is covered with slabs of side 50 cm. The cost of making each corner slab is Kshs 600 while the cost of making each smaller slab is Kshs 50.

Calculate

(i) The number of smaller slabs used

(ii) The total cost of the slabs used to cover the whole path

- 20.** A cylindrical solid of radius 5 cm and length 12 cm floats lengthwise in water to a depth of 2.5 cm as shown in the figure below.



Calculate the area of the curved surface of the solid in contact with water, correct to 4 significant figures

- 21.** Two cylindrical containers are similar. The larger one has internal cross-section area of 45 cm^2 and can hold 0.945 litres of liquid when full. The smaller container has internal cross-section area of 20 cm^2
- (a) Calculate the capacity of the smaller container
- (b) The larger container is filled with juice to a height of 13 cm. Juice is then drawn from it and emptied into the smaller container until the depths of the juice in both containers are equal.

Calculate the depths of juice in each container.

- (c) On fifth of the juice in the larger container in part (b) above is further drawn and emptied into the smaller container. Find the difference in the depths of the juice in the two containers.

- 22.** A metal bar is a hexagonal prism whose length is 30 cm, the cross section is a regular hexagon with each side of length 6 cm

Find

- (i) The area of the hexagonal face (3mks)
- (ii) The volume of the metal bar (2mks)

- 23.** A cylindrical water tank of diameter 7 metres and height 2.8 metres

- (a) Find the capacity of the water tank in litres
- (b) Six members of family use 15 litres each per day. Each day 80 litres are used for cooking and washing and a further 60 litres are wasted.

Find the number of complete days a full tank would last the family (2mks)

- (c) Two members of the family were absent for 90 days. During the 90 days wastage was reduced by 20% but cooking and washing remained the same. Calculate the number of days a full tank would now last the family
24. Pieces of soap are packed in a cuboid container measuring 36 cm by 24 cm by 18 cm. Each piece of soap is similar to the container. If the linear scale factor between the container and the soap is $\frac{1}{6}$ find the volume of each piece of soap.
25. A pyramid of height 10cm stands, on a square base ABCD of side 6 cm.
- (a) Draw a sketch of the pyramid
 - (b) Calculate the perpendicular distance from the vertex to the side AB.

For Marking Schemes/Answers

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