Answer all questions

1. Use logarithm tables to evaluate. (4 Marks)

$$\sqrt{\frac{3.749 \times 0.5826}{0.0505 \div 0.835}}$$

2. Find the gradient of a straight line passing through A(a - 4, 3) B(8, -6), hence find the equation of AB. (4 Marks)

3. Find the equation of a straight line which passes through (5,4) and is perpendicular to the line $4y = 3x + 7$. (3 Marks)

4. A ladder 10m long leans against a wall and makes an angle of 27^0 with the wall. How far from the wall is the foot of the ladder? (3 Marks)

5. A chord $\overline{AB}$ of a circle centre O, is 6cm long and makes an angle of 40^0 with OA. Calculate the radius of the circle. (3 Marks)

6. Factorize the expression :

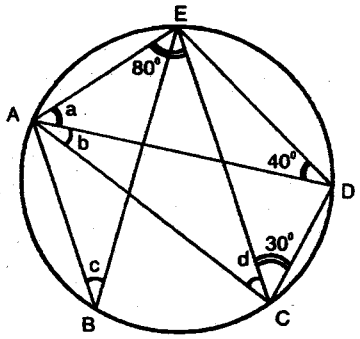
$x^2 - 19x - 20$ **(2 Marks)**

7. Solve the inequality

$-2x + 1 < x - 5 < 5 - x$ **(3 Marks)**

8. Given that $a = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$, $b = \begin{pmatrix} 4 \\ -6 \end{pmatrix}$, $c = \begin{pmatrix} -5 \\ 21 \end{pmatrix}$ and $ma + nb = c$, form two simultaneous equations and solve for m and n. **(4 Marks)**

9. Find the angles marked by letters a, b, c and d. **(4 Marks)**



10. Find the area of triangle PQR in which PQ = 6cm, QR = 7cm and $\angle PQR = 34^0$. **(3 Marks)**

11. Solve the equation : (3 Marks)

$$x - \frac{4}{x} + 3 = 0$$

12. The interior angle of a regular polygon is 108^0.

a) Find the number of sides it has. (2 Marks)

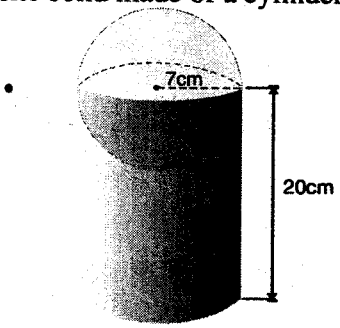
b) Find the size of the exterior angle. (1 Mark)

13. A man bought 10 mangoes at KShs. 9.00 each. He ate four of the mangoes and sold the remainder making an overall profit of KShs. 8.00. Calculate : -

a) His selling price per mango. (2 Marks)

b) The percentage profit on each mango. (2 Marks)

14. The figure below shows a composite solid made of a cylinder and a hemisphere.



Find its : -

a) Total surface area. (5 Marks)

b) Volume (5 Marks)

15. The table below represents the average marks obtained by Form II students in a test :

Marks	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
Frequency	3	2	5	10	12	11	5	2

a) What is the modal class? (1 Mark)

b) Make a frequency distribution table to represent the data hence calculate the

i) Mean (3 Marks)

ii) Median (3 Marks)

iii) Draw a frequency polygon for the data. (4 Marks)

16. Show the regions represented by the following inequalities (on the same axes). (8 Marks)
$5x + 2y = 15$
$y = 4$
$y = 0$
$4x + 3y = 0$ (***you are provided with a graph grid paper for this question***)

17. Find the number such that ¼ of it is added to $4\frac{1}{3}$, the result is the same as when $\frac{1}{3}$ of it is subtracted from $20\frac{2}{3}$. (3 marks)

18. A container of height 90cm has a capacity of 4.5litres. What is the height of a similar container of volume $9m^3$. (3 marks)

MATHEMATICS MARKING SCHEME FORM 2

1.

No.	S.F.	Log	
3.749	3.749 x 100	0.5739	
0.5826	5.826 x 10-1	1.7654	
			0.3393
0.0505	5.05×10^{-2}	2.7033	
0.835	8.35 x 10-1	1.9217	2.6250
36.12	3.612 x 101		1.5577

2. A(-4, 3) B(8, 6) C(x, y)

$M = \frac{-6-3}{8-4} = \frac{-9}{12} = \frac{-3}{4}$

$\frac{y+6}{x-8} = \frac{-3}{4}$ $4(y+6) = -3(x-8)$

$4y + 24 = -3x + 24$

$4y = -3x + 24 - 24$

$y = \frac{-3x}{4}$

3. $4y = 3x + 7$

$y = \frac{3x}{4} + \frac{7}{4}$

$m_1 = \frac{3}{4}$

$m_2 = \frac{-4}{3}$

$\frac{y-4}{x-5} = \frac{-4}{3}$

$3(y-4) = -4(x-5)$

$3y = -4x + 20 + 12$

$y = \frac{-4x}{3} + \frac{32}{3}$

4. $\text{Cos } 27^0 = \frac{h}{10}$

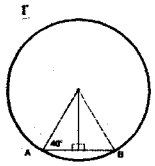
$8.9 = h$

$8.9^2 + b^2 = 10^2$

$b^2 = \sqrt{20.79}$

$b = 4.6$

5. $\text{Cos } 40^0 = \frac{3}{r}$



$r = \frac{3}{\text{Cos}40^0} = \frac{3}{0.766}$

$= 3.9$

6. $x^2 - 19x - 20$

$x - 20x + x - 20$

$x(x - 20) + 1(x - 20)$

$(x + 1)(x - 20)$

7. $-2x + 1 < x - 5 < 5 - x$

$-2x + 1 < x - 5$ $\quad x - 5 < 5 - x$

$-2x < x - 5 - 1$ $\quad x + x < 5 + 5$

$-2x < -6$ $\quad 2x < 10$

$x > 2$ $\quad x < 5$

$2 < x < 5$

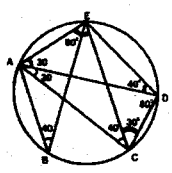
8. $m\begin{pmatrix}1\\3\end{pmatrix} + n\begin{pmatrix}4\\-6\end{pmatrix} = \begin{pmatrix}-5\\21\end{pmatrix}$

$\begin{pmatrix}m\\3m\end{pmatrix} + \begin{pmatrix}4n\\-6n\end{pmatrix} = \begin{pmatrix}-5\\21\end{pmatrix}$

$m + 4n = -5$ $\quad m = 3$

$3m - 6n = 21$ $\quad n = -2$

9.



10. $A = \frac{1}{2}ab\text{Sin}\theta = \frac{1}{2} \times 6 \times 7\text{Sin}34^0$

$= 21\text{Sin}34^0$

$= 21 \times 0.5591$

$= 11.74$

11. $x - \frac{4}{x} + 3 = 0$

$x^2 - 4 + 3x = 0$

$(x^2 - 1)(x + 4) = 0$

$x = 1 \quad x = -4$

12. a) 180^0

-108^0 Angle at the centre $= 72^0$

72^0 No of sides $= \frac{360^0}{72^0} = 5$ sides

b) Size of exterior angle $180 - 108 = 72^0$

13. a) B.P. $= 10 \times 9 = 90/=$

S.P. $= 90 + 8 = 98$

S.P. per mango $= \frac{98}{6} = 16.30$

b) $16.30 - 9.00 = 7.30$

$\frac{7.30}{9.00} \times 100 = 81.48\%$

14. Hemisphere $= 2\pi r^2$

$= 2 \times 3.142 \times 7 \times 7$

$= 308\text{cm}$

Cylinder base $= \pi r2$

$= 3.142 \times 7 \times 7$

$= 154$

Cylinder curved surface $= 2\pi rh$

$= 2 \times \frac{22}{7} \times 7 \times 13$

$= 572$

Total surface area $= 308 + 154 + 572 = 1034\text{cm}^2$

Volume of cylinder $= \pi r^2 h$

$= \frac{22}{7} \times 7 \times 7 \times 13$

$= 2002$

Volume of hemisphere $= \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \frac{22}{7} \times 7 \times 7 \times \frac{1}{2}$

$= 2156\text{cm}^3$

Total volume $= 2002 + 2156 = 4158\text{cm}^3$

15. a) 55-59

b)

Marks	Mid-point	f	fx
35-39	37.5	3	112.5
40-44	42.5	2	85
45-49	47.5	5	237.5
50-54	52.5	10	525
55-59	57.5	12	690
60-64	62.5	11	687.5
65-69	67.5	5	337.5
70-74	72.5	2	145
		$\Sigma f = 50$	$\Sigma fx = 2795$

i) $\frac{\Sigma fx}{\Sigma f} = \frac{2795}{50} = 55.9$

ii) Median

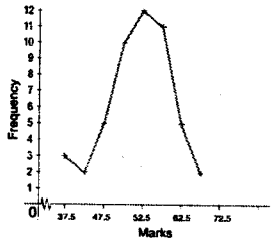
$= 54.5 + \frac{\frac{50}{2} - 20}{12} \times 5$

$= 54.5 + \frac{5}{12} \times 5$

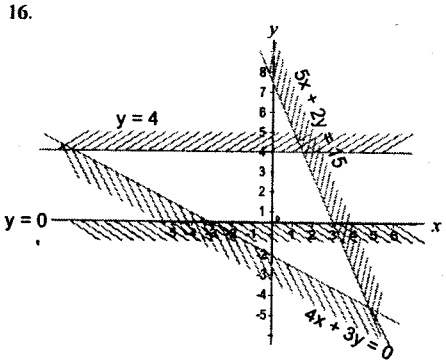
$= 56.58$

WORK & TURN

15. Frequency Polygon



16.



17. Let the number be x

Hence $\frac{1}{4}x + 4\frac{1}{3} = 20\frac{2}{3} - \frac{1}{3}x$

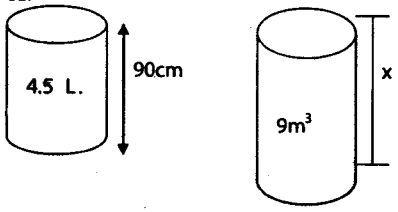
$\frac{1}{4}x + \frac{1}{3}x = 20\frac{2}{3} - 4\frac{1}{3}$

$\frac{7}{12}x = \frac{49}{3}$

$x = \frac{49}{3} \times \frac{12}{7}$

$x = 28$

18.



4.5L= 4.5 x 10^3 cm^3

$9m^3$ = 9 x 10cm^3

v. s .f 4.5 x 10^3 : 90 x 10^6

1 : 2000

l. s. f 3 : $3\sqrt{2000}$

= 1 : 12.6

But disc 90cm = x

height = 90 x 12.6

= 1,134 cm