

# THE E-LEARN EXAMINATIONS BOARD

## P.7 BEGINNING OF TERM TWO

2024

### MATHEMATICS GUIDE

*Time Allowed: 2 hours 15 minutes*



Index No.

EMIS No.						Personal No.		

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Read the following instructions carefully:

1. Do not forget to write your **school** or **district name** on the paper.
2. This paper has two sections: **A** and **B**. Section **A** has **20** questions and section **B** has **12** questions. The paper has **14** printed pages altogether.
3. Answer **all** questions. **All** working for both sections **A** and **B** must be shown in the spaces provided.
4. **All** answers **must** be written using a **blue** or **black** ball point pen or ink. Any work written in pencil will **not** be marked.
5. Unnecessary **changes** in your work and handwriting that cannot be read easily may lead to **loss of marks**.
6. Do not fill anything in the table indicated: **"For Examiners' use only"** and boxes inside the question paper

FOR EXAMINERS' USE ONLY		
Qn. No.	MARKS	EXR'S NO.
1 – 5		
6 – 10		
11 – 15		
16 – 20		
21 – 22		
23 – 24		
25 – 26		
27 – 28		
29 – 32		
TOTAL		

## SECTION A: 40 MARKS

Answer **all** the questions in this section.

Questions **1** to **20** carry two marks each.

1. Workout:  $36 \div 6$

$$\frac{36}{6} = \underline{\underline{6}}$$

**Method 1**

**Method 2**

$$36 - 6 = 30$$

$$30 - 6 = 24$$

$$24 - 6 = 18$$

$$18 - 6 = 12$$

$$12 - 6 = 6$$

$$6 - 6 = 0$$

**Method 3**

$$\begin{array}{r} 6 \overline{)36} \\ - 0 \downarrow \\ 36 \\ - 36 \\ \hline 00 \end{array}$$

2. Write in words: 1,995.

**One thousand, nine hundred ninety five**

3. Round off 34.567 to the nearest tenths.

$$\begin{array}{r} 34.567 \\ = 34.567 \\ + 0.1 \\ \hline 34.6 \end{array}$$

4. Four black books cost sh.24000. Find the cost of 8 similar black books

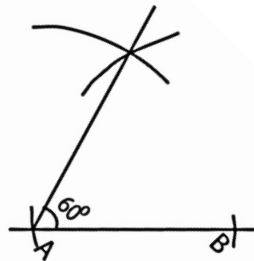
**4 books cost sh 24000**

$$\begin{array}{l} \text{1 book costs } \frac{\text{shs. } 24000}{4} \\ = \text{sh } 6000 \end{array}$$

**8 books will cost sh 6000  $\times$  8**

$$= \underline{\underline{\text{shs. } 48000}}$$

5. Using ruler, a sharp pencil and a pair of compasses only, construct an angle of  $60^\circ$  at point A



6. Given that,  $17_n = 15_{\text{ten}}$ . Find the base represented by n.

$$\begin{array}{l} 17_n = 15_{\text{ten}} \\ (1 \times n^1) + (7 \times n^0) = 15 \\ (1 \times n) + (7 \times 1) = 15 \end{array}$$

$$\begin{array}{l} n + 7 = 15 \\ n + 7 - 7 = 15 - 7 \\ \underline{\underline{n \text{ is base nine}}} \end{array}$$

7. Workout:  $(42 \div 6) - (30 \div 6)$  using distributive property

$$(42 - 30) \div 6$$

$$= 12 \div 6$$

$$= \frac{12^2}{6}$$

$$= \underline{\underline{2}}$$

8. Given -4, 3, -1, 0 and 2. Arrange the integers in ascending order.



$$= \underline{\underline{-4, -1, 0, 2, 3}}$$

9. Express 7.8 in standard form

$$= 7.8 \times 10^0$$

$$= \underline{\underline{7.8 \times 10^0}}$$

10. Express 0.363636.....as a vulgar fraction in it's simplest form.

$$0.363636$$

$$= \frac{36-0}{100-1}$$

$$= \frac{36^4}{99_{11}}$$

$$= \frac{4}{11}$$

$$k = 0.3636$$

$$100 \times k = 0.3636 \times 100$$

$$100k = 36.3636$$

$$100k = 36.3636$$

$$\underline{k} = 0.3636$$

$$99k$$

$$\frac{99k}{99} - \frac{36^4}{99_{11}}$$

$$k = \frac{4}{11}$$

Let the fraction be k

11.  $\frac{5}{8}$  of water in the tank lasts a company for 45 days. How long will  $\frac{2}{3}$  of the water in the same tank last the company?

$$5 \text{ parts} \rightarrow 45 \text{ days}$$

$$1 \text{ Part} \rightarrow \frac{45}{5} \text{ days}$$

$$8 \text{ parts} \rightarrow \left( \frac{45}{5} \times 8 \right) \text{ days}$$

$$= \underline{\underline{72 \text{ days}}}$$

$$\text{Full tank lasts 72 days}$$

$$\frac{2}{3} \times 72^{\frac{2}{3}} \text{ days}$$

$$2 \times 24$$

$$= \underline{\underline{48 \text{ days}}}$$

12. Find the Lowest common factor(LCF) of 3 and 5

$$3 \div 1 = 3$$

$$3 \div 3 = 1$$

$$F_3 = \{1, 3\}$$

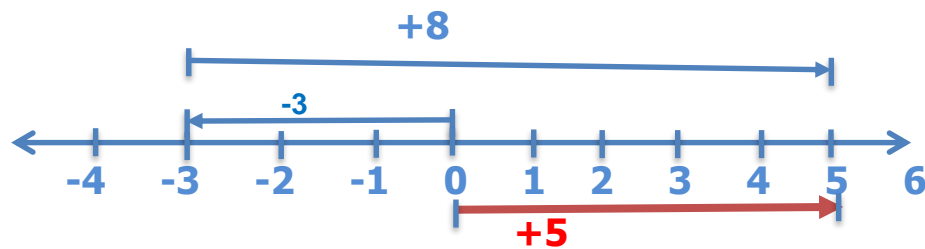
$$5 \div 1 = 5$$

$$5 \div 5 = 1$$

$$F_5 = \{1, 5\}$$

$$\underline{\text{LCF} = 1}$$

13. simplify;  $-3 + +8$  using a number line



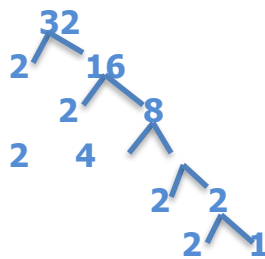
14. Set k has 32 subsets. Find  $n(k)$

$$2^n = \text{no of sub sets}$$

$$2^n = 32$$

$$2^n = 2^5$$

$$\underline{n = 5}$$



15. Find the smallest number of mangoes that can be divided among 6 girls or 8 boys and leaves 2 as a remainder.

$$\text{No of mangoes} = (\text{LCM} + 2)$$

2	8	6
2	4	3
2	2	3
3	1	3
	1	1

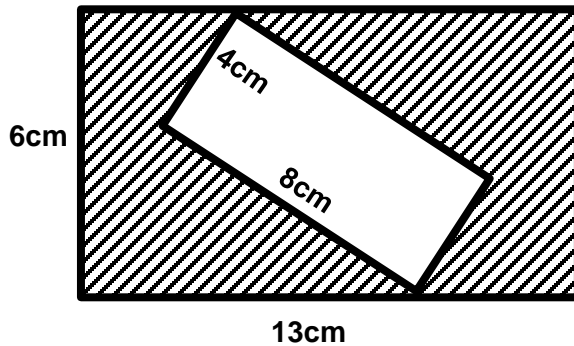
$$\text{LCM} = 2 \times 2 \times 2 \times 3$$

$$= 4 \times 6$$

$$= 24 + 2$$

$$\underline{\text{= 26 mangoes}}$$

16. Find the area of the shaded part.



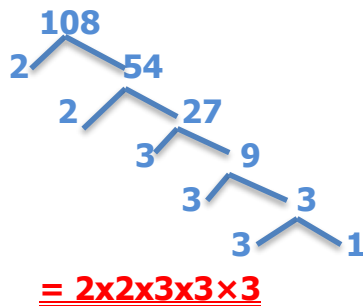
Area of the shaded part = Area of big rectangle – area of small rectangle.

$$\begin{aligned}
 &= (L \times W) - (L \times W) \\
 &= (13 \times 6) \text{cm}^2 - (8 \times 4) \text{cm}^2 \\
 &= 78 \text{cm}^2 - 32 \text{cm}^2 \\
 &= \underline{46 \text{cm}^2}
 \end{aligned}$$

17. The base area of a cylinder is 154sq.cm. Calculate its volume if the height is 20cm.

$$\begin{aligned}
 \text{Vol} &= (\text{Base area} \times \text{Height}) \\
 &= 154 \text{cm}^2 \times 20 \text{cm} \\
 &= \underline{3080 \text{cm}^3}
 \end{aligned}$$

18. Express 108 as the product of its prime factors.



$$= \underline{2 \times 2 \times 3 \times 3 \times 3}$$

19. Express 0.000765 in standard form

$$\begin{aligned}
 0.000765 \times 10 &= 0.00765 \\
 0.00765 \times 10 &= 0.0765 \\
 0.0765 \times 10 &= 0.765 \\
 0.765 \times 10 &= 7.65
 \end{aligned}$$

$$= \underline{7.65 \times 10^{-4}}$$

20. Solve :  $3a - 6 = a + 4$

$$\begin{aligned}
 3a - 6 &= a + 4 \\
 3a - 6 + 6 &= a + 4 + 6 \\
 3a &= a + 10 \\
 3a - a &= a - a + 10 \\
 \frac{2a}{2} &= \frac{10}{2} \\
 \underline{a} &= \underline{5}
 \end{aligned}$$

## SECTION B: 60 MARKS

Answer **all** questions in this section.

Marks for each question are indicated in brackets.

21. a) change  $\frac{8}{33}$  into a recurring decimal

$$\frac{8}{33} = 8 \div 33$$

$$\begin{array}{r} 0.2424... \\ 33 \overline{) 8.0000} \\ \underline{-0} \phantom{00} \\ 80 \\ \underline{-66} \phantom{00} \\ 140 \\ \underline{-132} \phantom{00} \\ 80 \\ \underline{-66} \phantom{00} \\ 140 \\ \underline{-132} \phantom{00} \\ 80 \end{array}$$

$$\bullet \bullet \frac{8}{33} = \underline{0.2424...}$$

- b) Simplify:  $2\frac{4}{5} \times \frac{2}{7} \div 1\frac{1}{9}$

$$\begin{aligned} & 2\frac{4}{5} \times \frac{2}{7} \div 1\frac{1}{9} \\ & \frac{14}{5} \times \frac{2}{7} \div \frac{10}{9} \\ & \frac{14}{5} \times \left( \frac{2}{7} \times \frac{9}{10} \right) \\ & = \frac{2}{5} \times \frac{9}{5} = \frac{18}{25} \end{aligned}$$

22. Two bells at a certain school are rung at intervals of 40 minutes and 50 minutes respectively for both lower and upper primary to change the lessons. How many lessons will each section have had by the time the two bells ring together?

LCM of 40 min and 50 min

2	40	50
2	20	25
2	10	25
5	5	25
5	1	5
	1	1

$$\begin{aligned} & 2 \times 2 \times 2 \times 5 \times 5 \\ & = (4 \times 10) 5 \\ & = \underline{200 \text{ minutes}} \end{aligned}$$

### No. of Lessons

Lower primary

$$\frac{20^50}{40}$$

= 5 lessons

Upper primary

$$\frac{20^40}{50}$$

= 4 lessons

23. A man deposited sh.40,000 for 5years at a simple interest rate of  $2\frac{1}{2}\%$  per year.

a) Calculate his simple interest.

$$\begin{aligned} \text{S. I} &= P \times R \times T \\ &= \text{Sh. } 40,000 \times 2\frac{1}{2}\% \times 5 \\ &= \text{sh.} 40,000 \times \frac{5}{2}\% \times 5 \\ &= \text{sh.} 40,000 \times \frac{5}{2} \div \frac{100}{1} \times 5 \\ &= \text{sh.} 40,000 \times \frac{5}{2} \times \frac{1}{100} \times 5 \\ &= \text{sh.} \overset{200}{\cancel{40,000}} \times \frac{5}{2} \times \frac{1}{100} \times 5 \\ &= \text{sh. } 200 \times 5 \times 5 \\ &= \underline{\text{sh. } 5,000} \end{aligned}$$

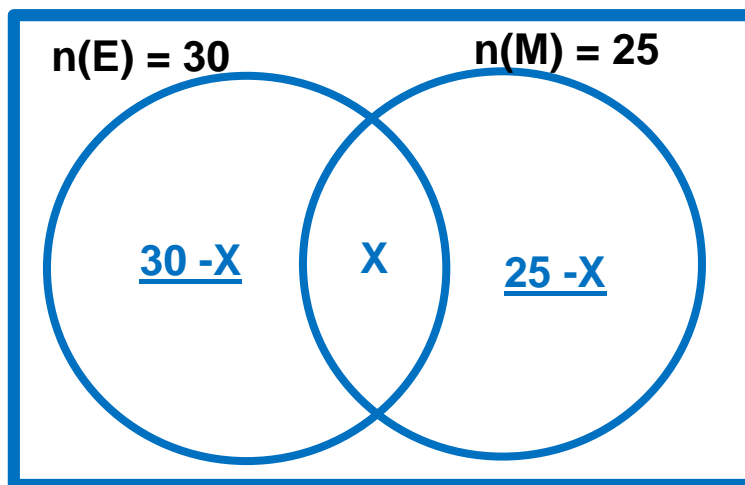
b) How much did he find on his account after 5years?

$$\begin{aligned} \text{Amount} &= \text{Principal} + \text{Interest} \\ &= \text{Sh. } 40,000 + \text{sh. } 5,000 \\ &= \underline{\text{sh. } 45,000} \end{aligned}$$

24. In a class of 45 pupils, 30 pupils like English (**E**) and 25 like Math(**M**).

**X** pupils like both subjects.

a) Draw a Venn diagram to show the above information.



b) How many pupils like both subjects.

$$(30 - X) + X + (25 - X) = 45$$

$$30 - X + X + 25 - X = 45$$

$$30 + 25 + X - X - X = 45$$

$$55 - X = 45$$

$$55 - 55 - X = 45 - 55$$

$$\frac{-x}{-1} = \frac{-10}{-1}$$

$$\underline{X = 10}$$

c) How many pupils like only one subject?

**Pupils who like only one subject are  $n(E)$  only +  $n(M)$  only**

$$(30 - X) + (25 - X)$$

$$(30 - 10) + (25 - 10)$$

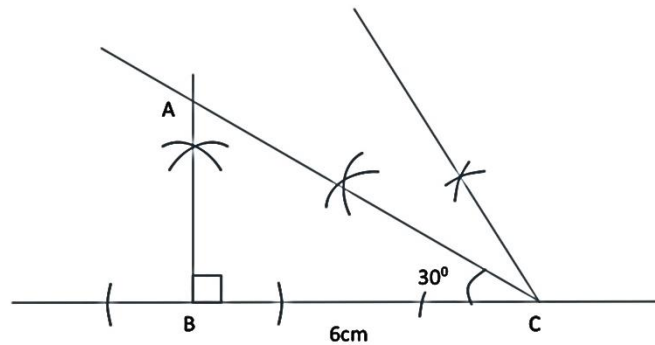
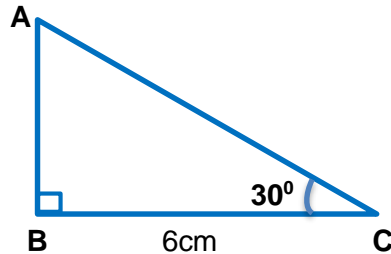
$$20 + 15$$

$$\underline{= 35 \text{ pupils}}$$



25. a) Using a pencil, ruler and pair of compasses only, construct a triangle **ABC** in which **BC = 6cm**, angle **ABC = 90°** and **BCA = 30°**

sketch



- b) Find the area of the triangle ABC

$$\begin{aligned}\text{Area} &= \frac{1}{2}bh \\ &= \frac{1}{2} \times 6 \times 4 \text{ (measure line AB)} \\ 3 \times 4 &= \underline{12\text{cm}^2}\end{aligned}$$

26. Mugisha went shopping and bought the following items.  
3 packets of wheat flour at sh.7800 each  
2000ml of cooking oil at sh.6500 per litre  
1 ½ kg of sugar at sh.5000/kg  
Packet of baking powder at sh.1500.

- a) Find mugiaha's expenditure

Wheat flour	Oil	Sugar	Baking =	Total Expenditure
Shs 78000 × 8 <u>= shs 23,400</u>	$\frac{2000}{1000} \times \text{sh. } 65000$ <u>= shs 13000</u>	$1 \frac{1}{2} \times 5000$ $\frac{3}{2} \times \text{sh. } 5000$ <u>= shs 7500</u>	shs 1500	Sh.23 400 Sh. 15 000 Sh. 7 600 Sh. <u>1 500</u> Sh. <u>45 400</u>

- b) Workout his change if he went shopping with a fifty thousand Shilling note.

$$\begin{aligned}\text{Shs } 50,000 &- 45,400 \\ &= \underline{\text{shs } 4,600}\end{aligned}$$

27. Kevina spent  $\frac{1}{4}$  of her monthly income on food,  $\frac{4}{5}$  of the remainder on fees and the rest on water. If she spent sh.70,000 more on fees than on food  
a) Find the fraction she spent on water

Food	Remainder	Fees	Water
$\frac{1}{4}$	$1 - \frac{1}{4}$ $= \frac{4}{4} - \frac{1}{4}$ $= \frac{3}{4}$	$\frac{4}{5}$ of $\frac{3}{4}$ $\frac{3}{5}$	$1 - \left( \frac{1}{4} + \frac{3}{5} \right)$ $1 - \left( \frac{5 + 12}{20} \right)$ $1 - \frac{17}{20}$ $\frac{20}{20} - \frac{17}{20}$ $= \frac{3}{20}$

- b) Find Kevina's monthly salary

$$\begin{aligned} & \frac{3}{5} - \frac{1}{4} \\ &= \frac{\left( \frac{3}{5} \times 20^4 \right) - \left( \frac{1}{4} \times 20^5 \right)}{20} \\ &= \frac{12 - 5}{20} \\ &= \frac{7}{20} \end{aligned}$$

$$\begin{aligned} 70 \text{ parts} &= \text{Sh } 70,000 \\ 1 &= \frac{\text{sh } 70000}{7} \\ 20 \text{ parts} &= \frac{\text{sh } 70000 \times 20}{7} \\ &= \text{Sh } 10000 \times 20 \\ &= \text{sh } 200,000 \end{aligned}$$

Or Let the monthly salary be K

$$\begin{aligned} \frac{7}{20} \times k &= 70000 \\ \frac{7k}{20} &= 70000 \times 20 \\ \frac{7k}{20} &= 70000 \times 20 \\ \underline{k} &= \text{shs } 200,000 \end{aligned}$$

28. a) Change 72km/hr to m/s

$$1\text{km} = 1000\text{m}$$

$$72\text{km} = 72 \times 1000\text{m}$$

$$1 \text{ hr} = 3600 \text{ sec}$$

$$S = \frac{D}{T}$$

$$\begin{aligned} &= \frac{72^2 \times 1000\text{m}}{3600\text{s}} \\ &= (2 \times 10)\text{ms} \\ &= 20\text{m/s} \end{aligned}$$

b). Aman drove at 80km/hr for  $2\frac{1}{4}$  hrs. He rested for 45minutes. After resting, he covered 240km at 80km/hr. Calculate the average speed for the whole journey

$$\text{average speed} = \frac{T.D.C}{T.T.T}$$

$$D = xy$$

$$D_1 = (80 \text{ km/hr} \times 2\frac{1}{4} \text{ hrs})$$

$$80 \text{ km/hr} \times \frac{9}{4} \text{ hrs}$$

$$D_1 = 180 \text{ km}$$

$$D_2 = 240 \text{ km}$$

$$T.D.C = (180 + 240) \text{ km} \\ = 420 \text{ km}$$

$$T = \frac{D}{S} \\ = \frac{240}{80} \\ = 3 \text{ hr}$$

$$T.T.T = 2\frac{1}{4} \text{ hr} + 45 \text{ min} + 3 \text{ hr} \\ = 2 \text{ hr} + 15 \text{ min} + 45 \text{ min} + 3 \text{ hrs} \\ = 2 \text{ hr} + 1 \text{ hr} + 3 \text{ h} \\ = 7 \text{ hours}$$

Average speed

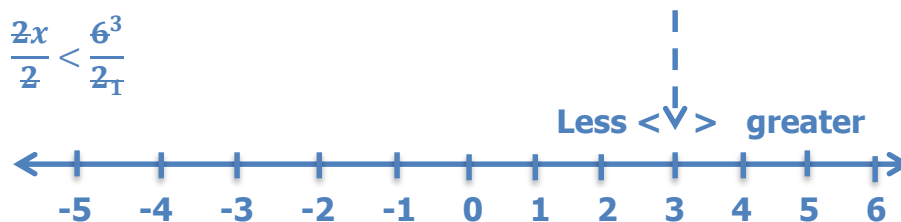
$$= \frac{420 \text{ km}}{7 \text{ hr}} \\ = 60 \text{ km/hr}$$

29. a) Solve then find the solution set of the inequality:

$$2x - 3 < 3$$

$$2x - 3 + 3 < 3 + 3$$

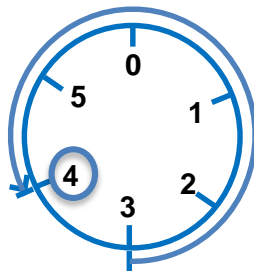
$$\frac{2x}{2} < \frac{6}{2}$$



$$x: x = \{2, 1, 0, -1, -2, -3, \dots\}$$

b) Workout:  $3 - 5 = \dots \pmod{6}$  using dial method

$$3 - 5 = 4 \pmod{6}$$



30. a) Malik bought 5 books and 3 pens at sh.25000. If the cost of a book is sh.200 more than a pen, find the amount Malik spent on each item.

**Let the cost of a pen be k**

pen	book	Total cost
k	K+sh. 200	-----
3 x k	5(k + sh. 200)	Sh. 25,000

$$3k + 5k + \text{sh.}1000 = \text{sh.}25,000$$

$$8k + \text{sh.}1000 = \text{sh.}25,000$$

$$8k + \text{sh.}1000 - \text{sh.}1000 = \text{sh.}25,000 - \text{sh.}1000$$

$$8k = \text{sh.}24,000$$

$$\frac{8k}{8} = \frac{\text{sh.}24,000}{8}$$

$$K = \text{sh.}3000$$

- b) Solve for k if a=12 and 6k-18=a

$$6k - 18 = 12$$

$$6k - 18 + 18 = 12 + 18$$

$$\frac{6k}{6} = \frac{30}{6}$$

$$K = 5$$

**cost a pen is sh.3000**

cost of a book

$$k + \text{sh.}200$$

$$\text{sh.}3000 + \text{sh.}200$$

**sh. 3200**

31. a) The area of a square garden is 144cm<sup>2</sup>. Find the length of each side. (use =  $\frac{22}{7}$ )

$$A = S \times S$$

$$A = S^2$$

$$\sqrt{144} = \sqrt{S^2}$$

$$\text{OR } \sqrt{(2 \times 2 \times 2 \times 2) \times (3 \times 3)} = \sqrt{S^2}$$

$$2 \times 2 \times 3$$

$$\underline{\underline{S=12\text{cm}}}$$

2	144
2	72
2	36
2	18
3	9
3	3
	1

- b). Find the capacity of a triangular prism whose base area is 120cm<sup>2</sup> and height 8cm.

$$\text{Vol} = (\text{Base area} \times \text{Height})$$

$$= 1200\text{cm}^2 \times 8\text{cm}$$

$$= 9600\text{cm}^3$$

$$\text{Cap} = \left( \frac{\text{vol}}{1000} \right) L$$

$$= \frac{9600}{1000}$$

$$= 9.6$$

$$= \underline{\underline{9.6 \text{ litres}}}$$

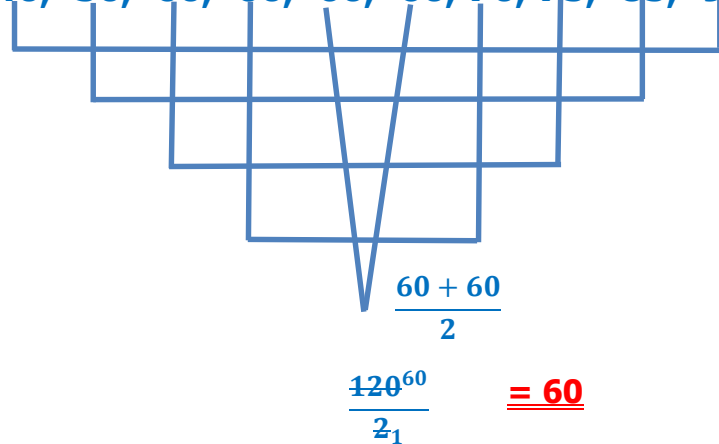
32. Ten children scored the following marks in mathematics on test. 70, 85, 40, 60, 90, 60, 75, 60, 50, 60.

a) Find the modal frequency

70	85	40	60	90	75	50
I	I	I	4	I	I	I

**Modal frequency = 4 times**

b) Find the median 40, 50, 60, 60, 60, 60, 70, 75, 85, 90



c) Find the mean mark

**Mean mark =  $\left( \frac{\text{sum of marks}}{\text{No of ...}} \right)$**

$$(70 \times 1) + (85 \times 1) + (40 \times 1) + (60 \times 4) + (90 \times 1) + (75 \times 1) + (50 \times 1)$$

$$\frac{70 + 85 + 40 + 240 + 89 + 75 + 50}{10}$$

$$\frac{650}{10}$$

$$= 65 \text{ MARKS}$$

**END**