MOCK 2024

P.7

E-LEARN EXAMINATIONS BOARD

MATH GUIDE

NAME: ....

SCHOOL: ....

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

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

1. Work out $42 \div 7$

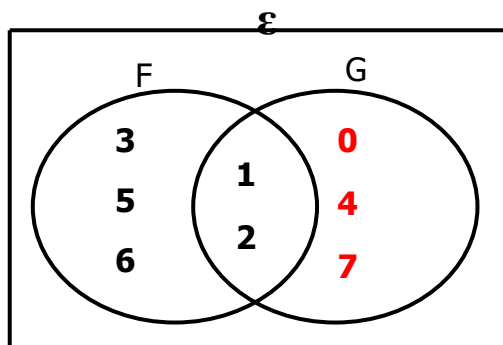   ***$42 \div 7 = 6$***   ***Accept different approaches. B_2 for correct answer.***

2. Write XCVI in Hindu Arabic Numerals.

XC	VI
90	6

   $90 + 6 = 96$ ***M_1 for converting, A_1 for 96***

3. Given that ε = {0, 1, 2, 3, 4, 5, 6, 7}, F − G = {3, 5, 6} and G − F = {0, 4, 7}. Represent this information on the Venn diagram below.

   B_1 for each correct entry

4. Simplify: $2(5m - 3) - 4(2m + 4)$

   $2(5m - 3) - 4(2m + 4)$
   $10m - 6 - 8m - 16$ ***M_1 for opening brackets***
   $10m - 8m - 6 - 16$ ***A_1 for $2m - 22$***
   $2m - 22$

5. Two angle **A** and **B** Are complementary angles. Angle **A** is $(3x-20^0)$ and angle **B** is $(x+30^0)$. Find the value of **x**

   $<A + <B + 90^0$
   $(3x - 20^0) + (x + 30^0) = 90^0$
   $3x + x + 30^0 - 20^0 = 90^0$ ***M_1 for $90^0 - n - 20^0$***
   $4x + 10^0 = 90^0$ ***A_1 for $x = 20^0$***
   $4x + 10^0 - 10^0 = 90^0 - 10^0$
   $X = 20^0$

6. Find the next two numbers in the sequence:

1,   3,   5,   7,   __9__ , __11__

+2   +2   +2   +2   +2
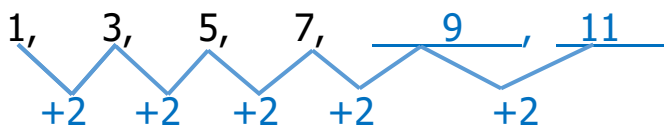
7. Kikomeko had $\frac{1}{2}$ of an apple and gave $\frac{1}{3}$ of it to Lomut. What fraction of the apple did he remain with?

Fraction given out	Remaining fraction
$\frac{1}{3} \times \frac{1}{2}$	$\frac{1}{2} - \frac{1}{6}$
$\frac{1}{6}$	$\frac{(3 \times 1) - (1 \times 1)}{6}$
	$\frac{3 - 1}{6}$
	$\frac{2}{6}$
	$\frac{1}{3}$

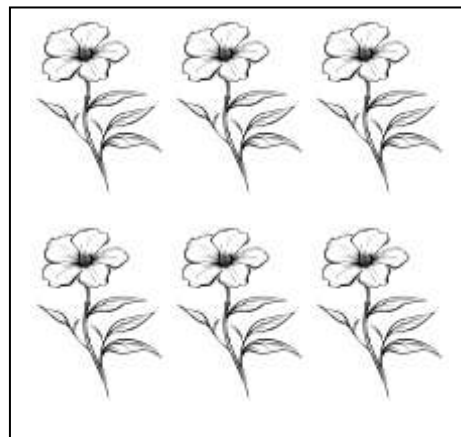8. A pupil slept after reading notes at 10:30 p.m. and woke up at 6:00 a.m. How long did he sleep?

Hrs	min
12	00
− 10	00
1	30

Duration	
Hrs	Min
1	30
+ 6	00
7	30

He slept for 7 hours and 30 minutes

9. Given that represents 7 flowers. Draw pictures to represent 42 flowers.

7 flowers => 1 picture
1 flower => $\frac{1}{7}$ pictures
42 flowers => $\frac{1}{7} \times 42$ Pictures
42 flowers => 6 pictures

10. Convert 4.5 km to metres.

1 km = 1,000 m

$$4.5 \text{ km} = \left(\frac{45}{10} \times 1000\right) \text{m}$$
M_1 for $\left(\frac{45}{10} \times 1000\right) \text{m}$

4.5 km = (45×100) m A_1 *for 4500 m*

4.5 km = 4,500 m

11. Using a protractor, measure and name the type of angle below.
Angle ABC = 45° B_1
Acute angle B_1

12. Decrease sh 4,800 in the ration of 4:5.

Method 1	**Method 2**

Method 1

$\frac{4}{5} \times sh\ 4800^{960}$

$4 \times sh\ 960$

Sh 3,840

Method 2

Let the new amount be p M_1 *for any correct approach*

Old	New
5	4
Sh 4,800	p

A_1 *for Sh 3,840*

$$\frac{5}{sh\ 4,800} = \frac{4}{p} \text{ (cross multiply)}$$

5 × p = sh 4,800 × 4

$$\frac{5p}{5} = \frac{sh\ 4,800 \times 4}{5}$$

p = h 960 × 4

p = sh 3,840

13. Simplify $- 5 - {}^- 3$
$- 5 - (- 3)$ M_1 *for $- 5 + 3$*
$- 5 + 3$ A_1 *for $- 2$*
$- 2$

14. A P. 6 boy bought 3 exercise books at sh 10,500 and two geometry sets at sh 8,000. Which item was more expensive?

1 book costs $\frac{sh\ 10,500}{3}$ M_1 *for both sh 3,500 and sh 4,000*

1 book costs sh 3,500

A_1 *for identifying the more expensive item*

1 set costs $\frac{sh8,000}{2}$

1 set costs sh 4,000 **A geometry set was more expensive.**

15. Electricity poles are fixed in a straight line along one side of the road. If the transformer is fixed on the 15th pole from either side, how many poles are there altogether?
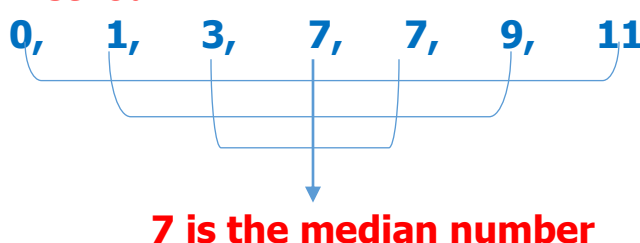
Method 1

No of poles = (position × 2) − 1
$$= (15 × 2) − 1$$
$$= 30 − 1$$
= 29 poles

Method 2

(14 + 14 + 1) poles
= 29 poles
M_1 any correct working
A_1 for 29 poles

16. Find the median of the numbers 7, 9, 3, 0, 7, 1 and 11

Method 1

0,   1,   3,   7,   7,   9,   11

7 is the median number

Method 2

0,   1,   3,   7,   7,   9,   11
The median number is 7

M_1 for arranging and matching

A_1 for identifying 7

17. Find the area of the rhombus below.

d_1 = (13.5 × 2) cm
**   = 27 cm**
d_2 = (5×2) cm
**   = 10 cm**
Area = $\frac{1}{2} × d_1 × d_2$
Area = $\frac{1}{2} × 27\ cm × 10\ cm$
Area = 135 cm^2

M_1 for correct approach. Go through the learner's work

A_1 for Area = 135 cm^2

18. Akol is 8 times as old as her son. The difference between their ages is 28 years. How old is the son now?

Let the son's age be x

son	Akol	difference
X	$8x$	28 years

$8x − x$ = 28 years

$$\frac{7x}{7} = \frac{28\ \text{years}}{7}$$

x = 4 years   The son is 4 years old now

M_1 for correct equation

A_1 for correct answer (4 years old)

19. The LCM of two numbers 36 and their GCF is 3. If the first number is 12, find the second number.

Second number $= \frac{LCM \times GCF}{1st\ no}$ **M_1 for substitution**

$$= \frac{36 \times 3}{1}$$ **A_1 for 9**

= 9 **Accept, LCM $\times$ GCF = 1st no $\times$ 2nd no**

20. In an interview conducted by 6 interviewers, 5 marks were awarded for a correct response and two marks were deducted for a wrong response. How many correct responses were given altogether if two interviewees failed 2 questions each and the rest failed 6 questions each from the 20 questions asked to each?

2(20 − 2) + 4 (20 − 6) **M_1 for any correct approach. Go through the learner's work**

(2× 18) + (4 × 12)

36 + 56 **A_1 for 92 correct responses**

92 correct responses

SECTION B: 60 *MARKS*

21. The Venn diagram below shows the number of players who play football (F) and Netball (N) in a club. Use it to answer the following questions.

a) If 22 players do not play football, find the value of x.   *(03 Marks)*

Number of players =

3x− 2 = 2 = 22 **M_1 for correct equation formed**

3x − 2+2 = 22+2

      3x =24 **A_1 for 5 without players**

$$\frac{3x}{3} = \frac{24}{3}$$

     $x = 8$

b) How many players play football?   *(02 Marks)*

(2x + 9) players **M_1 for correct substitution**

[(2×8) + 9] players

(16 + 9) players **A_1 for 19 with players**

25 players

22. (a) The exchange rate for United States dollars to Uganda shillings is **US$ 1 to Ugsh 3,600** and the exchange rate of Kenya shillings to Uganda shillings is **Ksh 1 to Ugsh 35**. How much does one pay for a TV set in Kenya shillings if it costs 700 US dollars? *(03 Marks)*

US $ to Ugsh
US $ 1 = Ugsh 3,600
US$ 700 = Ugsh 3,600×700
US $ 700 = Ugsh 2,520,000
M₁ for Ugsh 2,520,000
B₁ for dividing
A₁ for Ksh 72,000

Ugsh to Ksh
Ugsh 35 = Ksh 1
Ugsh 1 = Ksh $\frac{1}{35}$
Ugsh 2,520,000 = Ksh $\left(\frac{1}{35} \times 2,520,000\right)$
Ugsh = Ksh 72,000

(b) Coffee exports have risen from 15,500 tonnes per year to 18,600 tonnes. Calculate the percentage rise in coffee exportation. *(03 Marks)*

Increase
  18,600 tonnes
− 15,500 tonnes
   3,100 tonnes

Percentage increase/rise = $\left(\frac{increase}{original\ no} \times 100\right)\%$

$$= \left(\frac{3100}{15500} \times 100\right)\%$$

= 20%

M₁ for increase (3,100 tonnes) B₁ for dividing A₁ for 20%

23. A worker spends $\frac{2}{5}$ of his salary on food, $\frac{1}{3}$ of the remainder on transport and the rest on both clothing and savings. He spends $\frac{1}{4}$ more on clothing than saving.

a) What fraction of the salary is saved? *(05 marks)*

Food	Remainder	Transport	Clothing and savings
$\frac{2}{5}$	$1 - \frac{2}{5}$ $\frac{5}{5} - \frac{2}{5} = \frac{3}{5}$	$\frac{1}{3} \times \frac{3}{5}$ $\frac{3}{15}$	$\frac{3}{5} - \frac{3}{15}$ $\frac{2}{5}$

Let the fraction for saving be n.

Saving	Clothing	Total
n	$\frac{1}{4} + n$	$\frac{2}{5}$

$n + \frac{1}{4} + n = \frac{2}{5}$

$(n \times 4) + (4 \times \frac{1}{4}) + (4 \times n) = \frac{2}{5} \times 4$

$4n + 1 + 4n = \frac{8}{5}$

$8n + 1 = \frac{8}{5}$

$(10 \times 8n) + (1 \times 10) = \frac{8}{5} \times 10$

$80n + 10 = 8$

$80n + 10 - 10 = 16 - 10$

$80n = 6$

$\frac{80n}{80} = \frac{6}{80}$

$n = \frac{3}{40}$

Therefore, she saved $\frac{3}{40}$

M_1 for remainder ($\frac{3}{5}$), M_1 for transport ($\frac{3}{15}$), M_1 for clothing and savings ($\frac{2}{5}$), M_1 for equation and A_1 for saved fraction ($\frac{3}{40}$)

b) If he saves sh 36,000, how much is his monthly salary?   *(02 Marks)*

Let his monthly salary be g.

$\frac{3}{40}$ of g = sh 36,000

$\frac{3g}{40} \times 40$ = sh 36,000 $\times$ 40

3g = sh 36,000 $\times$ 40

$\frac{3g}{3} = \frac{\text{sh } 36,000 \times 40}{3}$

g = sh 12,000 $\times$ 40

g = sh 480,000

Therefore, his monthly salary is sh 480,000

M_1 for forming the equation

A_1 for sh 480,000

Accept other approaches

24. (a) If today is Saturday, what day of the week was it 43 days ago?   *(03 Marks)*

Day − 43 = ___ (finite 7)

6 − 43 = ____ (finite 7)

$\left(\frac{43}{7}\right) = 6$ **remainder 1**

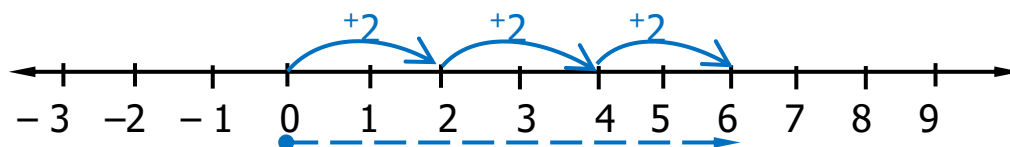**6 − 1 = 5(finite 7)**

The day was Friday

Accept other approaches like calendar

M_1 for correct approach

A_1 for Friday

(b) Work out 3 × 2 using a number line.   *(02 Marks)*

3 × 2 means 3 jumps of 2 steps each

Therefore, 3 × 2 = 12

Look at the learner's work and award 2 marks if the learner has made 3 jumps of 2 steps, has indicated the arrows and +2 on every arrow.

25. Jonathan left home for town at 6:00 a.m. He drove at a steady speed of 60 km/hr for $2\frac{1}{2}$ hours before stopping at the fuel station. He took 15 minutes at the fuel station and continued for the journey for $1\frac{1}{4}$ hours.

   a) If he covered a total distance of 200 km at what speed did he drive to cover the remaining distance? *(03 Marks)*

Dist. From home to fuel station
Dist. = speed × time

$$\frac{60\ km}{1\ hour} \times 2\frac{1}{2}\ \textbf{hours}$$

$$\frac{60\ km}{1\ hour} \times \frac{5\ hours}{2}$$

30 km × 5
150 km

Remaining distance
  200 km
  − 150 km
  _____
     50 km
  _____

Speed = Distance ÷ Time

$$= 50\ km \div 1\frac{1}{4}\ \textbf{hours}$$

$$= \frac{50\ km}{1} \div \frac{5\ hours}{4}$$

$$= \frac{50\ km}{1} \times \frac{4}{5\ hours}$$

$$= \frac{10\ km \times 4}{1\ hour}$$

Average speed $= \dfrac{\textbf{Total distance}}{\textbf{Total time}}$

(Marks)

$$= \frac{200\ km}{2\frac{1}{2}hr + \left(\frac{15}{60}\right)hr\ 1\frac{1}{4}hr}$$

$$= \frac{200\ km}{4\ hr}$$

$$= \frac{50\ km}{1\ hr}$$

= 50 km/hour

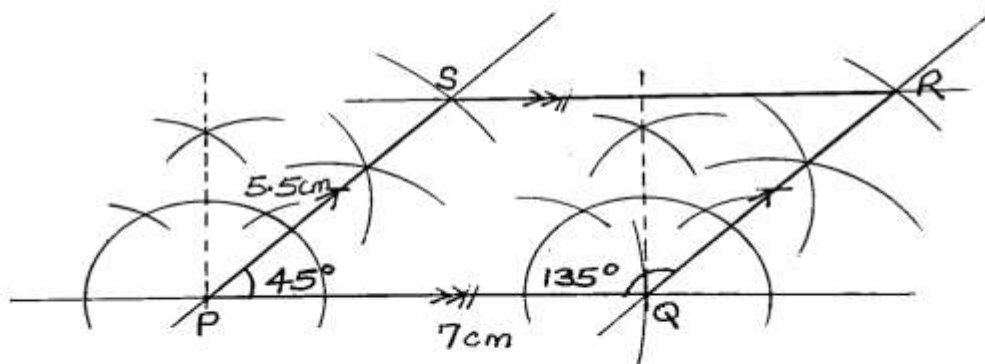*M_1 for correct substitut[ion] in the formula*
A_1 50 km/hr

26. (a) Using a ruler, a pencil and a pair of compasses only, construct a parallelogram PQRS in which line PQ = 7 cm angle RQP = 135° and line PS = 5.5 cm *(03 Marks)*

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Sketch diagram
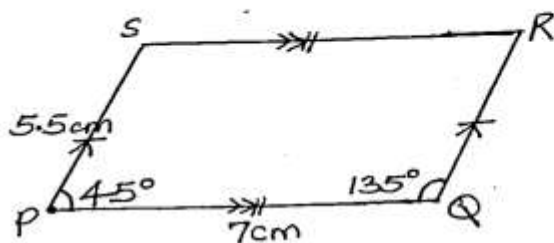
Accurate diagram

(b) $\overline{PR} = 11.5$ cm

(b) Measure diagonal PR **11.5** cm   *(01 Mark)*

27. (a) Solve $\dfrac{n^3}{2} + 4 = 36$ *(03 Marks)*

$(2 \times \dfrac{n^3}{2}) + (4 \times 2) = 36 \times 2$

$n^3 + 8 = 72$

$n^3 + 8 = 72 - 8$

$\sqrt[3]{n^3} = \sqrt[3]{64}$

$\sqrt[3]{n \times n \times n} = \sqrt[3]{(2 \times 2 \times 2) \times (2 \times 2 \times 2)}$

$n = 2 \times 2$

n = 4

M_1 for $n^3 + 8 = 72$

M_1 for $\sqrt[3]{n \times n \times n} = \sqrt[3]{(2 \times 2 \times 2) \times (2 \times 2 \times 2)}$

A_1 for n = 4

(b) Write the solution set for $2 > x \geq -4$ *(01 Mark)*

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

B_1 for correct set.

28. In the diagram below, line AB is parallel to line CD. Angle FBH = 48° and angle EGH = 70° Study it carefully and use it to answer questions that follow.

    Use the diagram in the question paper as a reference.
    a) Find the size of angle k.   *(02 Marks)*

    k + 48° = 70°   **Go through learner's work**
    k + 48° − 48° = 70° − 48⁰   **Award accordingly**
    <u>k = 22°</u>
    A learner should indicate in the figure his or her findings.

    b) Find the size of angle EFD.   *(03 Marks)*

    <FEG = 180° − (48°+22°)   **Award accordingly**
    <EFG = 180⁰ − 270⁰   **A learner should indicate in the**
    <FEG = 110°   **figure his or her findings.**

    Let <EFD be x
    x + 110° + 70° + 48° = 360° (int. angle sum of a quadrilateral)
    x + 228° = 360⁰
    x + 228⁰ − 228° = 360° − 228°
    x = 132°
    <u><EFD = 132°</u>

29. (a) Given that $23_m = 111_{three}$. Find the base represented by m.   *(03 Marks)*

m^1	m^0		3^2	3^1	3^0
2	3	=	1	1	1

$(2 \times m^1) + (3 \times m^0) = (1 \times 3^2) + (1 \times 3^1) + (1 \times 3^0)$
$(2 \times m) + (3 \times 1) = (1 \times 3 \times 3) + (1 \times 3) + (1 \times 1)$
2m + 3 = 9 + 3 + 1
2m + 3 = 12
2m + 3 − 3 = 13 − 3   **M_1 for correct equation**
2m = 10   **M_1 for collecting like terms**
$\dfrac{2m}{2} = \dfrac{10}{2}$ **A_1 for base five**
m = 5

m is base five

(b) Write the place value of 3 in 2341_{five}. (01 Mark)

Five five fives	Five fives	Fives	Ones
2	3	4	1

Five fives B_1

30. In the figure below, find the area of the shaded part. (05 Marks)
Use the diagram in the question paper as a reference.

Area of quadrant

Area $= \frac{1}{4}\pi r^2$

$= \frac{1}{4} \times \frac{22}{7} \times 14 \text{ cm} \times 14 \text{ cm}$

$= 11 \text{ cm} \times 14 \text{ cm}$

$= 154 \text{ cm}^2$

Area of shaded part
    266 cm²
  − 154 cm²
    112 cm²

Area of trapezium

Area $= \frac{1}{2}$ h (a + b)

$= \frac{1}{2} \times 14 \text{ cm } (24 \text{ cm} + 14 \text{ cm})$

$= 7 \text{ cm} \times 38 \text{ cm}$

$= 266 \text{ cm}^2$

2 marks for obtaining area of quadrant
2 marks for obtaining area of trapezium
A₁ for 112 cm²

31. (a) The average height of six pupils is 140 cm. When two pupils join them, the average height becomes 137.5 cm. Find the total height of the two pupils who joined the group. (03 Marks)

Total height of 6 pupils
140 cm × 6
= 840 cm

New number of pupils
(6 + 2) pupils
8 pupils

Total height of 8 pupils
137.5 cm × 8
= 1,100 cm

Total height of the two pupils
    1100 cm
 −   840 cm
    260 cm

M₁ for 840 cm
M₁ for 1,100 cm
A₁ for 260 cm

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(b) The base of the mountain is at 5486 m below the sea level and the peak is at 4201 m above the sea level. What is the full height of the mountain?

(02 Marks)

Height = Range
Range = highest − lowest
      = 4201 m − (− 5486 m)
      =4201 m + 5486 m
      =9687 m

Approach 2
Full height = height of the peak + Depth of the base
        4201 m
    +5486 m
      9687 m
M_1 correct working
A_1 for 9687 metres

32. (a) On the graph below, plot the points **A (0, $^+$4), B($^+$3, $^-$1) and C($^-$3, $^-$1)**.

(03 Marks)
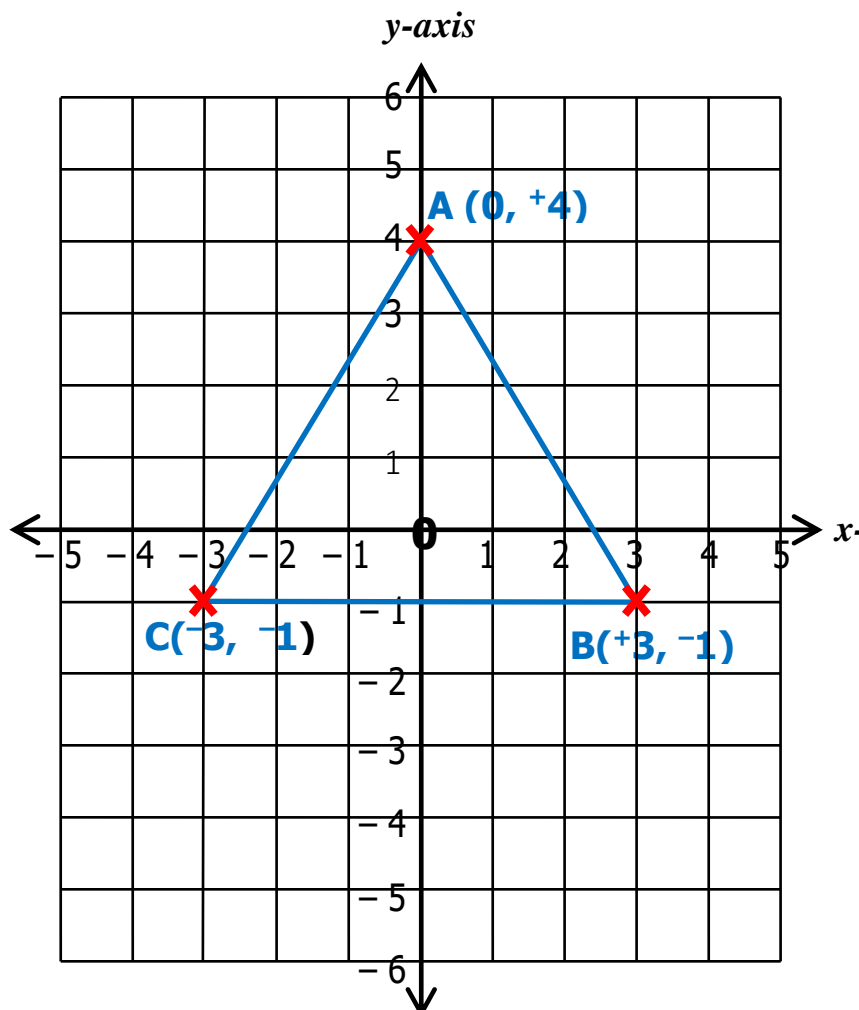
B_1 for every correct point plotted at named

J_1 for correct joining

(b) Join A to B, B to C and C to A. *(01 Mark)*
(c) Name the figure formed after joining the points *(01 Mark)*
   equilateral triangle B_1

END

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