



**NAMIREMBE DIOCESE**  
**DEPARTMENT OF EDUCATION**  
**COUHEIA MOCK EXAMINATION 2024**  
**PRIMARY SEVEN**  
**MATHEMATICS**

*Time Allowed : 2 Hours 30 Minutes*

**Index No.**

Random No.						Personal No.		

Pupil's Name: Johnson 0756765866 T

School Name: .....

Archdeaconry: .....

Read the following instructions carefully:

1. This paper has **two** sections: **A** and **B**. Section **A** has **20** questions and section **B** has **12** questions. The paper has 12 pages altogether.
2. Answer all the questions. All answers to both sections **A** and **B** must be written in the spaces provided.
3. **All** answers must be written using a blue or black ball point pen or ink. Any work written in pencil other than graphs, pictures and diagrams will **not** be marked.
4. Unnecessary changes of work may lead to **loss** of marks.
5. Any handwriting that cannot easily be read may lead to **loss** of marks.
6. Do **not** fill anything in the boxes indicated: "**For examiners' Use only**" and those inside the question paper

FOR EXAMINERS' USE ONLY		
Qn. No.	MARKS	EXR'S SIGN
1-5		
6-10		
11-15		
16-20		
21-22		
23-24		
25-26		
27-28		
29-30		
31-32		
TOTAL		

2024 COUHEIA Examination

*Turn Over*

# SECTION A : 40 MARKS

Answer all the questions in this section.

Question 1 to 20 carry two marks each.

1. Work out :  $46 \div 2$

$$\frac{46}{2} = 23$$

23

2. Simplify :  $b - 3b + 4b$

$$b - 3b + 4b$$

$$b + 4b - 3b$$

$$5b - 3b$$

2b

3. Write CDLXV in Hindu - Arabic numerals.

$$CD \rightarrow 400$$

$$LX \rightarrow 60$$

$$V \rightarrow + 5$$

$$465$$

465

4. Given that  $W = \{ \text{Sun, Mon, Tue, Wed} \}$

Find the number of ~~subsets~~ <sup>subsets</sup> in set W.

$$\text{Subsets} = 2^n$$

$$= 2^4$$

$$= 2 \times 2 \times 2 \times 2$$

= 16 subsets

5. Find the next number in the sequence:

$$3, 8, 5, 10, 7, 12$$

$$+5 -3 +5 -3 +5$$

$$7 + 5 = 12$$

6. Simplify :  $\frac{2}{9} \div \frac{1}{3}$

$$\frac{2}{9} \div \frac{1}{3} = \frac{2}{9} \times \frac{3}{1}$$

$$= \frac{1}{6}$$

$$\frac{2}{9} \times \frac{3}{1}$$

7. Using a ruler, a pencil and a pair of compasses only, construct an angle of  $105^\circ$  in the space below



8. Work out :  $1110_{\text{two}} + 111_{\text{two}}$

$$\begin{array}{r} 1110_{\text{two}} \\ + 111_{\text{two}} \\ \hline 10101_{\text{two}} \end{array}$$

$$\frac{2}{2} = 1 \text{ rem } 0$$

$$10101_{\text{two}}$$

9. Find the square root of  $5\frac{1}{16}$

$$5\frac{1}{16}$$

$$(5 \times 16) + 1$$

$$\begin{array}{r} 81 \\ 81 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 81 \\ 3 \wedge 27 \\ 3 \wedge 9 \\ 3 \wedge 3 \end{array}$$

$$\begin{array}{r} 16 \\ 2 \wedge 8 \\ 2 \wedge 4 \\ 2 \wedge 2 \end{array}$$

$$\sqrt{\frac{3^4 \times 2^4}{2^4 \times 2^4}}$$

$$\frac{3 \times 3}{2 \times 2} = \frac{9}{4}$$

$$2\frac{1}{4}$$

10. Change 750grams into kilograms.

K-H-D-G-d-c-m

$$1 \text{ gm} = \frac{1}{1000} \text{ kg}$$

$$750 \text{ gms} = \left( \frac{1}{1000} \times 750 \right) \text{ kg}$$

$$\left( \frac{750}{1000} \right) \text{ kg}$$

$$= 0.75 \text{ kg}$$

11. Solve :  $2m - 3 = 2$  (finite 7)

$$2m - 3 = 2 \text{ (finite 7)}$$

$$2m - 3 + 3 = 2 + 3 \text{ (finite 7)}$$

$$2m = 5 \text{ (finite 7)}$$

Add the finite

$$2m = 5 + 7 \text{ (finite 7)}$$

$$\frac{2m}{2} = \frac{12}{2} \text{ (finite 7)}$$

$$m = 6 \text{ (finite 7)}$$

$$m = 6 \text{ (finite 7)}$$

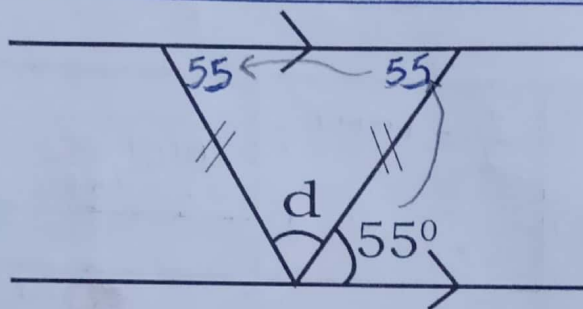


12. A bus travels at an average speed of 110 km./h for 1 hour 24 minutes. Find the distance covered.

$$\begin{aligned}
 D &= S \times T \\
 &= \frac{110 \text{ km}}{\text{h}} \times \frac{24}{60} \text{ h} \\
 &= \frac{22}{5} \times 110 \text{ km} \times \frac{7}{5} \\
 &= 154 \text{ km}
 \end{aligned}$$

$$= 154 \text{ km}$$

13. In the figure below, find the size of angle d.



$$d + 55^\circ + 55^\circ = 180^\circ$$

$$d + 110^\circ - 110^\circ = 180^\circ - 110^\circ$$

$$d = 70^\circ$$

14. If  $\frac{3}{4}$  kg of sugar cost shs. 3,900, find the cost of  $3\frac{1}{2}$  kg

kg	cost	shs. 3900 x 4	7 x shs. 2600
$\frac{3}{4}$	→ shs. 3900	$\frac{3900 \times 4}{3}$	
1	→ shs. 3900 ÷ $\frac{3}{4}$	$3\frac{1}{2} \text{ kg} \rightarrow \frac{7}{2} \times \text{shs. } \frac{3900 \times 4}{3}$	shs. 18200

15. Given that  $a = -3$ ,  $b = 1$  and  $c = -4$ , find the value of

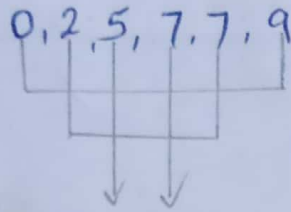
$$\frac{ac}{b^2 - ac}$$

$\frac{-3 \times -4}{1^2 - (-3 \times -4)}$	$\frac{12}{1 - 12}$	$\frac{12}{-11}$	$= -\frac{12}{11}$
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Turn Over.

16. Find the median of the following numbers :

9, 2, 7, 0, 5, 7



$$\frac{5+7}{2}$$

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

$$= 6$$

17. The price of a bar of soap was sh. 4.500. It was later increased by 40%. Find the new price of the bar of soap.

$$100\% + 40\% = 140\%$$

140% of shs 4500

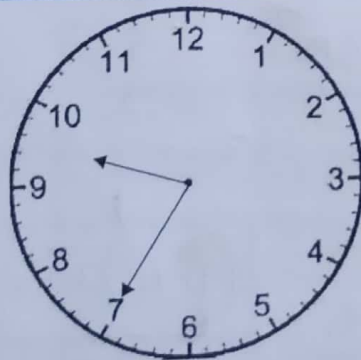
$$\frac{140}{100} \times \text{shs } 4500$$

shs 6300

shs 6300

$$\begin{array}{r} 45 \\ \times 14 \\ \hline 180 \\ + 450 \\ \hline 630 \end{array}$$

18. Write the afternoon time shown on the clock face



9:35 pm

19. The total number of blue and black pen in a bag is 24. If the probability of picking a black pen is  $\frac{3}{8}$ , how many blue pens are in the bag?

24 pens  
3 Black  
5 Blue

$$8-3=5$$

$$\frac{5}{8} \times 24 \text{ pens}$$

= 15 Blue pens

20. A stretch of a road is 450m long. Trees are planted in a straight line along the road at intervals of 9m from each other. Find the number of trees planted.

$$\left(\frac{450\text{m}}{9\text{m}}\right) + 1$$

$$(50 + 1) \text{ trees}$$

$$= 51 \text{ trees}$$

### SECTION B : 60 MARKS

Answer all the questions in this section.

Marks for each question are indicated in brackets.

21. (a) Simplify :  $\frac{4m^3 \times 6m^6}{8m^5}$  (2marks)

$$\frac{4m^3 \times 6m^6}{8m^5}$$

$$3m^{(3+6)-5}$$

$$3m^{9-5}$$

$$3m^{9-5}$$

$$3m^4$$

- (b) Expand 948.063 using powers of 10. (2marks)

$$9\overset{2}{4}\overset{1}{8}\overset{0}{.}\overset{-1}{0}\overset{-2}{6}\overset{-3}{3}$$

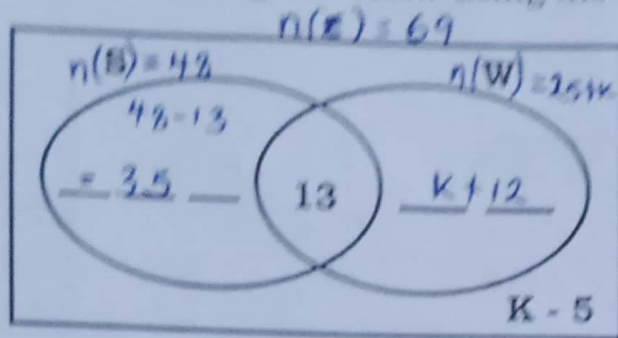
$$(9 \times 100) + (4 \times 10) + (8 \times 1) + \frac{6}{10} + \frac{3}{100}$$

$$(9 \times 10^2) + (4 \times 10^1) + (8 \times 10^0) + (6 \times 10^{-2}) + (3 \times 10^{-3})$$

22. In a class of 69 pupils, 48 drink soda (s), (k + 12) pupils drink mineral water (w) only, 13 drink both soda and mineral water while (k - 5) pupils drink neither of the drinks.



(a) Complete the Venn diagram below using the information above.



(2marks)

(b) Find one value of  $K$

(2marks)

$$K + 12 + K - 5 + 48 = 69$$

$$K + K + 12 + 48 - 5 = 69$$

$$2K + 60 - 5 = 69$$

$$2K + 55 - 55 = 69 - 55$$

$$2K = 14$$

$$\frac{2K}{2} = \frac{14}{2}$$

$$K = 7$$

$$K = 7$$

(c) How many pupils drink mineral water?

(01 Marks)

$$25 + k$$

$\downarrow$   
7

(25 + 7) pupils  
32 pupils

32 pupils

23. The rates at which a bank pays and sells different foreign currencies are given in the table below. Study and use it to answer the questions that follows.

Currency	Buying rate	Selling rate
1 US dollar (\$)	Ug. sh. 3,600	Ugsh. 3,700
1 Pound sterling (£)	Ug sh. 4,500	Ugsh. 4,700
1 Kenya shilling (Ksh)	Ugsh, 35	Ugsh, 36

(a) If Apolot has Ugsh. 925,000, how much money in Us dollars will she get from the bank?

(2marks)

$$\left( \frac{\text{Ugsh. } 925000}{\text{ug.sh. } 3700} \right) \text{ dollars}$$

US dollars 250

250 U.S. dollars.

(b) If kapere has Ksh. 37,600, how many pounds sterling can he get from the bank?

(3marks)

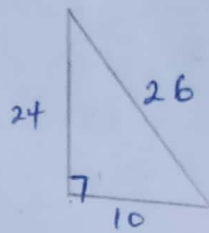
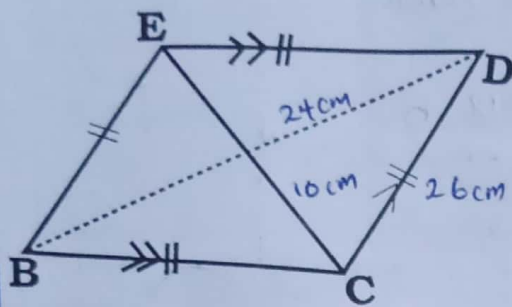
$$\left( \frac{37600 \times 35}{4700} \right) \text{ pounds sterling}$$

280 pounds sterling

280 pounds sterling

Turn Over.

24. The perimeter of the rhombus BCDE below is 104 cm and diagonal EC = 20 cm.



$$\frac{20}{2} = 10$$

$$\begin{array}{r} 24 \\ 24 \\ \hline 96 \\ 180 \\ \hline 576 \end{array}$$

- (a) Find the length of diagonal BD.

(4marks)

$$P = 4S$$

$$\frac{4S}{4} = \frac{104}{4}$$

$$S = 26 \text{ cm}$$

$$a^2 + b^2 = c^2$$

$$10^2 + b^2 = 26^2$$

$$\frac{b^2 + 100 - 100}{\sqrt{b^2}} = \frac{676 - 100}{\sqrt{b^2}}$$

$$b = 24$$

$$BD = 2 \times 24 \text{ cm}$$

$$= 48 \text{ cm}$$

- (b) Calculate the area of rhombus BCDE.

(2marks)

$$A = 4 \left( \frac{1}{2} \times b \times h \right)$$

$$= 4 \times 120 \text{ cm}^2$$

$$= 4 \left( \frac{1}{2} \times 24 \text{ cm} \times 10 \text{ cm} \right)$$

$$= 480 \text{ cm}^2$$

25. (a) Write  $\frac{8}{11}$  as a recurring decimal.

(2marks)

$$\begin{array}{r} 0.72 \\ 11 \overline{) 8.000} \\ \underline{0 \times 11 = 0} \phantom{00} \\ 8.0 \phantom{0} \\ \underline{7.7} \phantom{0} \\ 0.30 \end{array}$$

$$= 0.7272 \dots$$

(b) Work out :  $\frac{0.759 - 0.003}{0.9 \times 1.4}$

(3marks)

$$\begin{array}{r} 0.759 \\ - 0.003 \\ \hline 0.756 \end{array}$$

$$\frac{0.756}{0.9 \times 1.4}$$

$$\left( \frac{756}{1000} \right) \div \left( \frac{9}{10} \times \frac{14}{10} \right) = \frac{6}{10}$$

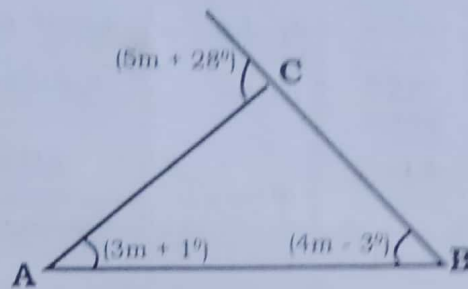
$$\frac{756}{1000} \times \frac{10}{9} \times \frac{10}{14} = 0.6$$

$$= \frac{6}{10}$$

$$0.6$$



26. Study the figure below and use it to answer the questions that follows



- (a) Find the value of  $m$ . (3marks)

$(3m+1) + (4m-3) = 5m+28$	$7m-5m = 28+2$	$m = 15^\circ$
$3m+4m+1-3 = 5m+28$	$\frac{2m}{2} = \frac{30}{2}$	
$7m-2 = 5m+28$	$m = 15$	

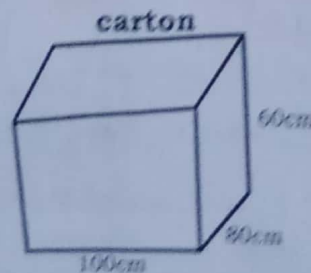
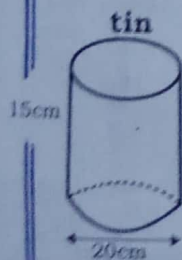
- (b) Calculate the size of angle ACB. (2marks)

$180 - (5m+28)$ $\downarrow$ $15$	$180 - (75+28)$ $180$ $-103$ <hr/> $77$	Angle ACB = $77^\circ$	
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27. A rabbit costs half as much as a chicken. The chicken costs one third as much as a turkey. If the total cost of the three animals is sh. 180,000, find the cost of 5 rabbits.

Let the cost of the turkey be $y$ .				$\frac{y}{1} + \frac{y}{3} + \frac{y}{6} = \text{sh. } 180,000$	(5marks) $\frac{2y}{6} = \text{sh. } 180,000 \times 6$ $y = \text{sh. } 120,000$ 5 rabbits $\frac{\text{sh. } 120,000 \times 5}{1}$ <hr/> $\text{sh. } 600,000$
Turkey	chicken	Rabbit	Total	$\frac{6y+2y+y}{6} = \text{sh. } 180,000$	
$y$	$\frac{1}{3}y$	$\frac{1}{2} \times \frac{1}{3}y$	sh. 180,000	$6 \times \frac{y}{6} = \text{sh. } 180,000 \times 6$	
$y$	$\frac{y}{3}$	$\frac{y}{6}$	180,000	$\frac{y}{6}$	

28. Cylindrical tins of jam each 15cm high and of diameter 20cm are to be packed standing upright in a rectangular carton 100cm long, 80cm wide and 60cm high.



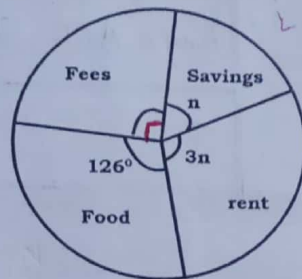
- (a) How many tins can be packed in the carton? (2marks)

Pack on the length	width	Height	Total tins packed
$\frac{100\text{cm}}{20\text{cm}}$	$\frac{80\text{cm}}{20\text{cm}}$	$\frac{60\text{cm}}{15}$	$(5 \times 4 \times 4) \text{ tins}$
$= 5 \text{ tins}$	$= 4 \text{ tins}$	$= 4 \text{ tins}$	$80 \text{ tins}$

- (b) Calculate the volume of the space that will be remaining after the tins have been packed into the carton. (take  $\pi = 3.14$ )

Volume of the carton	Volume of the cylinders (tins)	(3marks)
$V = L \times W \times h$ $= 100\text{cm} \times 80\text{cm} \times 60\text{cm}$ $= 480,000\text{cm}^3$	$V = \pi r^2 h \times 80$ $= 3.14 \times \frac{20\text{cm}}{2} \times \frac{20\text{cm}}{2} \times 15\text{cm} \times 80$ $= (3.14 \times 80 \times 15)\text{cm}^3$ $= 376,800\text{cm}^3$	$\text{left space}$ $\frac{480,000\text{cm}^3}{- 376,800\text{cm}^3}$ $103,200\text{cm}^3$

29. The pie chart below shows the expenses of a family. Study and use it to answer questions that follows.



$$\begin{array}{r} 360 \\ - 216 \\ \hline 144 \end{array}$$

$$\begin{array}{r} 314 \\ \times 12 \\ \hline 628 \\ + 3140 \\ \hline 376800 \end{array}$$

- (a) Find the value of n. (2marks)

$$\begin{aligned} 3n + n + 126 + 90 &= 360 \\ 4n + 216 - 216 &= 360 - 216 \\ \frac{4n}{4} &= \frac{144}{4} \\ n &= 36 \end{aligned}$$

$$n = 36^\circ$$

- (b) If the family spends sh. 216,000 more on rent than fees, what is the family's total income? (3marks)

$3n$ $\downarrow$ $36$ $3 \times 36$ $108 - 90$	$18^\circ$ Let his salary be g. $18^\circ$ of g is shs. 216,000 $\frac{18}{360} \times g = \text{shs. } 216,000$	$\frac{18g}{360} = \text{shs. } 216,000 \times 360$ $\frac{18g}{18} = \frac{\text{shs. } 216,000 \times 360}{18}$ $g = \text{shs. } 4,320,000$
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30. Joan spends  $\frac{1}{3}$  of her monthly salary on food,  $\frac{1}{4}$  on rent,  $\frac{3}{10}$  of the remainder on medical care and saves sh. 210,000. What is her monthly salary?

Food + Rent $\frac{1}{3} + \frac{1}{4} = \frac{4+3}{12}$ $= \frac{7}{12}$ Remainder $\frac{12}{12} - \frac{7}{12} = \frac{12-7}{12}$	$\frac{5}{12}$ Medical care $\frac{3}{10} \times \frac{5}{12} = \frac{1}{8}$ Total expenditure $\frac{7}{12} + \frac{1}{8} = \frac{14+3}{24}$	$\frac{17}{24}$ Saves $\frac{24}{24} - \frac{17}{24} = \frac{24-17}{24}$ $= \frac{7}{24}$ Salary	(5marks) shs. 210,000 $\div \frac{7}{24}$ shs. 210,000 $\times \frac{24}{7}$ 7 shs. 720,000
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31. Town A is 180km from town B. A car left town A for town B at 8:55a.m and travelled at a steady speed of 80km per hour.

(a) At what time did the car reach town B?

(2marks)

$T = \frac{D}{S}$ $= \frac{180 \text{ km}}{80 \text{ km/hr}}$ $= 2 \text{ hours and } 15 \text{ minutes}$	Hours      minutes 8      55 + 2      15 11      10 At 11:10 am	$\frac{60}{60} = 1 \text{ rem } 0$ 11:10 am
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(b) If the car left town B at 12:15p.m and reached town A at 2:15pm., calculate the speed of the car.

(3marks)

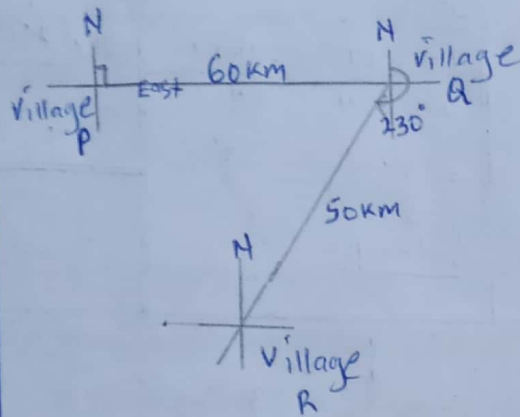
Hours      minutes 14      15 - 12      15 2      00 2 hours	$S = \frac{D}{T}$ $= \frac{180 \text{ km}}{2 \text{ hr}}$ $= 90 \text{ km/h}$	Change time to 24 hour clock system 2:15pm $\rightarrow$ 1415hrs 12:15pm $\rightarrow$ 1215hrs
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32. A motorist left village P and drove 60km east wards to village Q. She then drove 50km on a bearing of  $230^\circ$  from village Q to village R.

(a) Draw a sketch to show the motorist's journey.

(1mark)



Scale

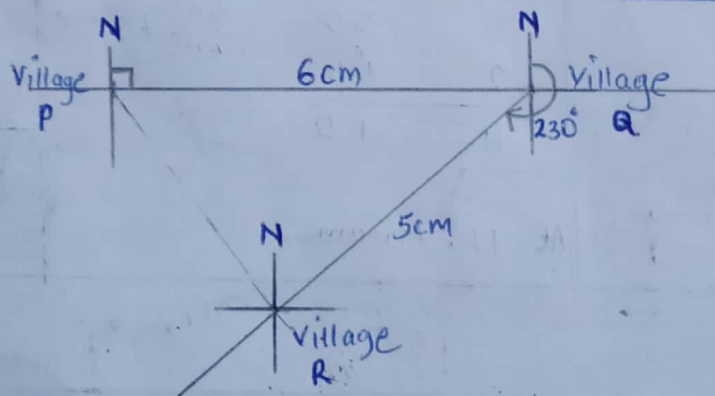
1 cm  $\rightarrow$  10 km

$$\frac{60 \text{ km}}{10 \text{ km}} = 6 \text{ cm}$$

$$\frac{50 \text{ km}}{10 \text{ km}} = 5 \text{ cm}$$

(b) Using a scale of 1cm to represent 10km, draw an accurate diagram to show the motorist's journey.

(3marks)



$$\begin{array}{r} 230 \\ - 180 \\ \hline 50 \end{array}$$

(c) Find the bearing of village R from village P.

(1mark)

$$\begin{array}{r} 180^\circ \\ - 36 \\ \hline 144^\circ \end{array}$$

144°

145°

END

12