

# CONFIDENTIAL EXAMINATIONS 2024

## P.7 MATHEMATICS

*Time allowed: 2hours 30minutes*

INDEX  
NO.

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CANDIDATE'S NAME .....Johnson.....0756765866.....

CANDIDATE'S SIGNATURE .....DATE .....

SCHOOL'S EMIS NO.....

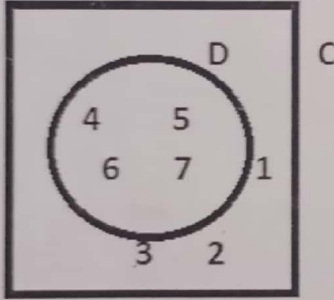
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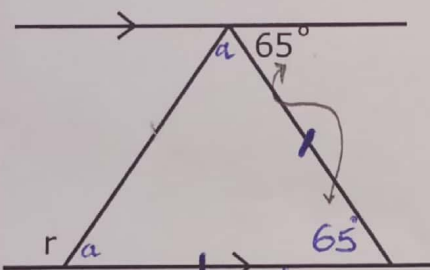
### READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

1. This paper has two sections **A** and **B**
2. All the working in both sections **A** and **B** should be shown in the spaces provided
3. All workings **MUST** be done using **blue** or **black point pen** or fountain pen. Diagrams **MUST** be drawn in pencil
4. Unnecessary changes of work may lead to loss of marks
5. Any handwriting that cannot be easily read may lead to loss of marks
6. Do not fill in anything indicated for examiners use only and those inside the paper

SECTION	MARKS
SECTION A	
SECTION B	
TOTAL	

### SECTION A

<p>1 Workout <math>10 \div 2</math></p> <hr/> $\frac{10}{2} = 5$ <hr/>	<p>2 Write four hundred ninety two in figures.</p> <p>Four hundred <math>\rightarrow 400</math>          ninety two <math>\rightarrow 7 + 92</math></p> <hr/> $\begin{array}{r} 7 + 92 \\ \hline 492 \end{array}$ <hr/>
<p>3 Given the sets C and D below.</p> <div style="text-align: center;">  </div> <p><math>C = \{4, 6, 5, 7, 3, 2, 1, 8\}</math>          Find <math>n(C) = 7</math></p> <hr/>	<p>4 Solve: <math>3p - 3 = 4</math> (finite 8)</p> <p><math>3p - 3 = 4</math> (finite 8)  <math>3p - 3 + 3 = 4 + 3</math> (finite 8)  <math>3p = 7</math> (finite 8)          Add the finite  <math>3p = 7 + 8</math> (finite 8)  <math>3p = 15</math> (finite 8)  <math>\frac{3p}{3} = \frac{15}{3}</math> (finite 8)  <math>p = 5</math> (finite 8)</p> <hr/>

<p>5 Express 60cm as a percentage of 3 meters.</p> <p>K-H-D-M-d-c-m</p> $1\text{cm} = \frac{1}{100}\text{m}$ $60\text{cm} = \left(\frac{1}{100} \times 60\right)\text{m}$ $= \left(\frac{60}{100} \times \frac{100}{3}\right)\%$ $= 20\%$	<p>6 What is the mean of <math>\frac{1}{2}</math> and <math>\frac{1}{3}</math></p> $\left(\frac{\frac{1}{2} + \frac{1}{3}}{2}\right) = \frac{2}{5}$ $\left(\frac{\frac{1}{2} + \frac{1}{3}}{2}\right) \times \frac{1}{2}$ $\left(\frac{3+2}{6}\right) \times \frac{1}{2}$ $\frac{5}{6} \times \frac{1}{2}$ $= \frac{5}{12}$
<p>7 In the diagram below, find the size of angle r.</p>  $a + a + 65 = 180$ $2a + 65 - 65 = 180 - 65$ $\frac{2a}{2} = \frac{115}{2}$ $a = 57.5$ $r = 65 + 57.5$ $r = 122.5$	<p>8 Find the lowest common multiple of two numbers whose product and GCF is 360 and 6 respectively.</p> $\frac{\text{product}}{\text{G.C.F}} = \text{L.C.M}$ $\frac{360}{6} = 60$ $= 60$

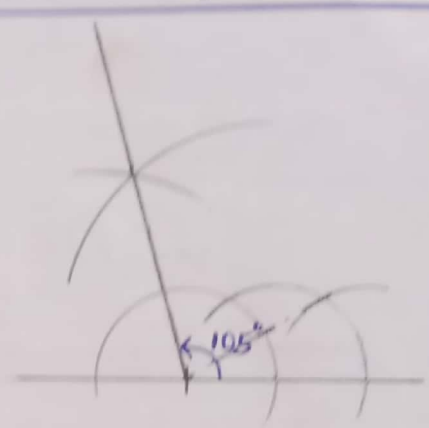
numbers  $\frac{60}{6} = 10$

Factors 2, 5

$2 \times 6, 5 \times 6$

$12, 30$

numbers are 12 and 30

<p>9 Work out: <math>4 \times 10^{-3}</math></p> <hr/> $4 \times \frac{1}{10^3}$ $4 \times \frac{1}{10 \times 10 \times 10}$ $4 \times \frac{1}{1000}$ $\frac{4}{1000}$ $0.004$ <hr/>	<p>10 Using a pair of compasses, a ruler and a pencil only, construct an angle of <math>105^\circ</math></p> <hr/>  <hr/>
<p>11 A tortoise at reptiles village has lived for 2490 years, Express the tortoise's age in Roman numerals.</p> <hr/> $2000 \rightarrow MM$ $400 \rightarrow CD$ $+ 90 \rightarrow XC$ <hr/> $MMCDXC \text{ years}$ <hr/>	<p>12 Set Q has 63 proper subsets. Determine its number of elements.</p> <hr/> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Proper Subsets = <math>2^n - 1</math></p> <math display="block">2^n - 1 = 63</math> <math display="block">2^n - 1 + 1 = 63 + 1</math> <math display="block">2^n = 64</math> <math display="block">2^n = 2^6</math> <math display="block">n = 6 \text{ elements}</math> </div> <div style="width: 35%; text-align: center;"> <math display="block">  \begin{array}{c}  64 \\  \wedge \\  2 \quad 32 \\  \wedge \\  2 \quad 16 \\  \wedge \\  2 \quad 8 \\  \wedge \\  2 \quad 4 \\  \wedge \\  2 \quad 2 \\  \wedge \\  2 \quad 1  \end{array}  = 2^6  </math> </div> </div> <hr/>

13 Five sets cost sh. 20,000  
How many similar sets can one buy with sh.36,000 at the same rate?

Sets	Cost
5	shs. 20,000
5	shs. 1
shs. 20,000	
shs. 1 × 36,000	shs. 36,000
shs. 20,000	

= 9 sets

14 Simplify:  $\frac{3k+2}{4} - \frac{k+1}{3}$

$$\frac{3k+2}{4} - \frac{k+1}{3} = \frac{(9k+6) - (4k+4)}{12}$$

$$= \frac{9k+6-4k-4}{12} = \frac{5k+2}{12}$$

15 Calculate  $(33.4 \times 9) - (9 \times 3.4)$  using distributive property.

$(33.4 - 3.4) \times 9$	33.4
9 (30)	- 3.4
270	30.0

16 Three porters can build the house in 6 days. How many more porters will be needed to build the same house in 2 days working at the same rate?

Porters	days	
3	6	= (9) porters
3 × 6	1	
	2	= 6 more porters
$\frac{3 \times 6^3}{2} = 9$		

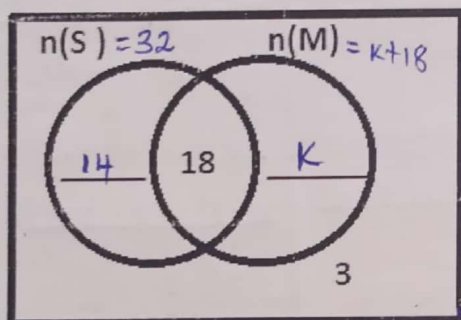


17	<p>It is 8:00a.m now. What time of the day will it be after 68 hours?</p> <hr/> <p><math>8 + 68 = \text{--- (finite 12)}</math> <math>76 = \text{--- (finite 12)}</math> Express 76 in (finite 12) <math>\frac{76}{12} = 6 \text{ rem } 4</math> <sup>even</sup> <math>= 4 \text{ (finite 12)}</math>  It will be 4:00 am</p> <hr/>	18	<p>Electric poles were fixed on both sides of the road 2km long at intervals of 20m. How many poles were fixed?</p> <hr/> <table border="1"><tr><td>K-H-O-M-d-c-m</td><td>(100+1) poles</td></tr><tr><td>1km = 1000m</td><td>101 poles</td></tr><tr><td>2km = 2x1000m = 2000m</td><td>Both sides</td></tr><tr><td>Spaces <math>\left(\frac{2000m}{20m}\right)</math> spaces</td><td>(2x101) poles</td></tr><tr><td>100 spaces</td><td>202 electric poles</td></tr><tr><td>electric poles</td><td></td></tr></table> <hr/>	K-H-O-M-d-c-m	(100+1) poles	1km = 1000m	101 poles	2km = 2x1000m = 2000m	Both sides	Spaces $\left(\frac{2000m}{20m}\right)$ spaces	(2x101) poles	100 spaces	202 electric poles	electric poles	
K-H-O-M-d-c-m	(100+1) poles														
1km = 1000m	101 poles														
2km = 2x1000m = 2000m	Both sides														
Spaces $\left(\frac{2000m}{20m}\right)$ spaces	(2x101) poles														
100 spaces	202 electric poles														
electric poles															
19	<p>In a class, there are 13 girls and 12 boys. What is the probability of choosing a boy at random to become a prefect?</p> <hr/> <p>Total pupils = 13 <math>\frac{+12}{25}</math>  <u>probability</u>  <math>= \frac{12}{25}</math></p> <hr/>	20	<p>A tourist has Ugsh82,500 and wants to buy US dollars from a forex bureau. How many dollars will the tourist get if US\$1=Ugsh2750?</p> <hr/> <p><math>\frac{\text{Ug-sh. } 82500}{\text{ug-sh. } 2750}</math> US.dollars  30 US.dollars</p> <hr/>												

SECTION B(60MARKS)

- 21 In a class of 50 pupils, 32 like science(S), K like Maths (M) only, 18 like both subjects while 3 like ~~both subjects~~. *neither of the two subjects.*  
Complete the Venn diagram below. (2marks)

$$\Sigma = 50$$



$$\begin{array}{r} 210 \\ 32 \\ -18 \\ \hline 14 \end{array}$$

- b) How many pupils like maths? (2marks)

$K + 32 + 3 = 50$ $K + 35 - 35 = 50 - 35$ $K = 15$	$\begin{array}{r} K + 18 \\ 15 \\ + 18 \\ \hline 33 \end{array}$ <p>33 pupils</p>
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- c) Find the probability of choosing a pupil at random who does not like mathematics to be a captain. (1mark)

$(M)' = 14 + 3$ $= 17$ <p>probability</p> $= \frac{17}{50}$	
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22  
a)

In a village of 450 people,  $\frac{3}{5}$  are males and the rest are females.  $\frac{2}{3}$  of the males are above 18 years and  $\frac{1}{4}$  of the females are below 18 years.  
Find the total number of people below 18 years of age. (3 marks)

<u>males</u> $\frac{3}{5} \times 450$ males $\frac{3}{5} \times 450 = 270$ males <u>females</u> $450 - 270 = 180$ females	<u>males above 18 yrs</u> $\frac{2}{3} \times 270$ males $\frac{2}{3} \times 270 = 180$ males above <u>males below 18 yrs</u> $270 - 180 = 90$ males below	<u>females below 18 yrs</u> $\frac{1}{4} \times 180$ females $\frac{1}{4} \times 180 = 45$ females below <u>Total people below</u> $90 + 45 = 135$ people	135 people
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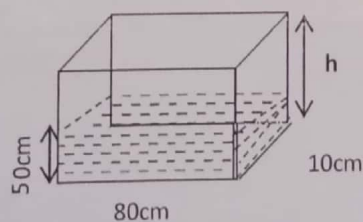
b)

If the number of males increased by 30, in what ratio did it increase? (2 marks)

<u>males</u> $270 + 30 = 300$ males	<u>ratio</u> $\frac{300}{270} = \frac{10}{9}$	<u>ratio form</u> $10 : 9$
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23

The tank below is  $\frac{1}{3}$  full of water.

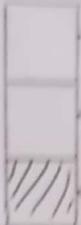


a)

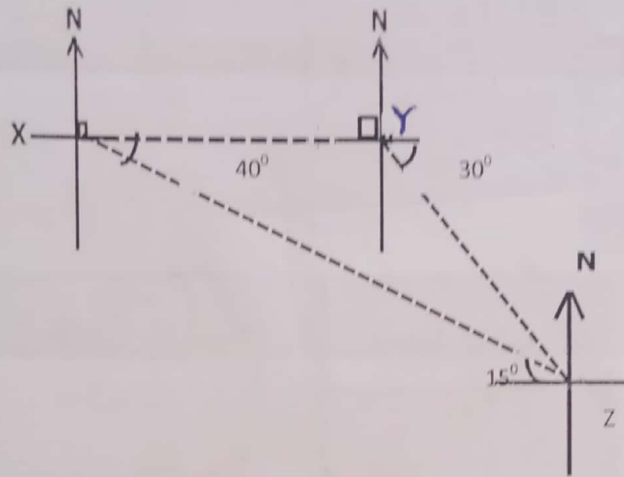
How many liters of water are in the tank? (2 marks)

$V = L \times W \times h$ $= 80 \text{ cm} \times 10 \text{ cm} \times 50 \text{ cm}$ $= 40000 \text{ cm}^3$	<u>Capacity</u> $1 \text{ litre} = 1000 \text{ cm}^3$	$\left( \frac{40000 \text{ cm}^3}{1000 \text{ cm}^3} \right) \text{ litres}$ $40 \text{ litres}$
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b	<p>How many liters are needed to fill the tank? (2marks)</p> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">  <div style="margin-left: 5px;"> <p>→ 40 litres</p> <p>→ 40 litres</p> <p>→ 40 litres</p> </div> </div> <div style="border: 1px solid black; padding: 10px; flex-grow: 1;"> <p><math>(40 + 40)</math> litres</p> <p>20 litres</p> </div> </div>
c	<p>Find the water level when the tank is completely full of water. (1mark)</p> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 10px; margin-right: 10px;"> <p><math>(40 \div \frac{1}{3})</math> litres</p> <p><math>(40 \times 3)</math> litres</p> </div> <div style="border: 1px solid black; padding: 10px; flex-grow: 1;"> <p><math>= 120</math> litres</p> </div> </div>
24a	<p>The scale on a map is 1:9000. If the distance on the map is 5cm, what is the actual distance in km? (2marks)</p> <div style="border: 1px solid black; padding: 10px; min-height: 300px;"> <p>1cm → 9000</p> <p>5cm → <math>(5 \times 9000)</math> cm</p> <p><math>= 45000</math> cm</p> <p>K-H-D-M-d-c-m</p> <p>1cm = <math>\frac{1}{100,000}</math> km</p> <p><math>= \left( \frac{1}{100,000} \times 45000 \right)</math> km</p> <p><math>= 0.45</math> km</p> </div>

b Use the diagram below to answer the questions that follow.



(2marks)

b Find the direction of:

(i) Y from Z

(1mark)

North west

(ii) Z from X

(1mark)

South East

25a Solve:  $9 - 2p = 3$

(2marks)

$$9 - 2p = 3$$

$$-2p + 9 = 3$$

$$-2p + 9 - 9 = 3 - 9$$

$$\begin{array}{rcl} -2p & = & -6 \\ \hline -2 & & -2 \end{array}$$

$$p = 3$$

b Six years ago, a man was ten times as old as the daughter.

Let the daughter's age be  $m$  6 years back

<p>If the sum of their present age is 45 years, how old is the daughter? now? (3marks)</p>											
<table border="1"> <tr> <th>Daughter</th><th>man</th><th>Time</th></tr> <tr> <td>m</td><td>10m</td><td>6 years ago</td></tr> <tr> <td>(m+6)</td><td>10m+6</td><td>now</td></tr> </table>	Daughter	man	Time	m	10m	6 years ago	(m+6)	10m+6	now	$\frac{11m}{11} = \frac{33 \text{ years}}{11}$ $m = 3 \text{ years}$ <p>Daughter was 3 years old</p> <p>Daughter now (3+6) years = 9 years</p>	<p>now 9 years</p>
Daughter	man	Time									
m	10m	6 years ago									
(m+6)	10m+6	now									
<p> <math>m+6+10m+6 = 45</math>  <math>m+10m+6+6 = 45</math>  <math>11m+12-12 = 45-12</math>  <math>11m = 33</math> </p>											
26a	<p>Using a pair of compasses, a ruler and a pencil only construct a parallelogram PQRS, where by PQ=7.7cm, angle PQR=45° and line QR = 3.8cm. (4marks)</p>										
	<p>Sketch</p>										
b)	<p>Measure angle PRS = 28° (1mark)</p> <p>Angle PRS = 28°</p>										
27	<p>Study the following exchange rates and answer the questions that follow.</p> <table border="1"> <tr> <th>Currency</th><th>Selling price (Ugsh)</th><th>Buying price (Ugsh)</th></tr> <tr> <td>Ksh 1</td><td>36</td><td>35</td></tr> <tr> <td>US \$1</td><td>3600</td><td>3560</td></tr> </table>		Currency	Selling price (Ugsh)	Buying price (Ugsh)	Ksh 1	36	35	US \$1	3600	3560
Currency	Selling price (Ugsh)	Buying price (Ugsh)									
Ksh 1	36	35									
US \$1	3600	3560									

	£ 1	4850	4800
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a) Anam had Ksh 2500, how much money in Uganda shillings did he get? (2marks)

$  \begin{array}{r}  25 \\  \times 25 \\  \hline  125 \\  + 500 \\  \hline  625  \end{array}  $	ug'sh 87,500	
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b) If Alvin had 240 pound sterling, How many US dollars did he get? (3marks)

$  \begin{array}{r}  240 \times 4800 \\  \hline  3600  \end{array}  $	320 us dollars
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28 The equation of a line is  $x = y - 2$   
Complete the table using the equation. (4marks)

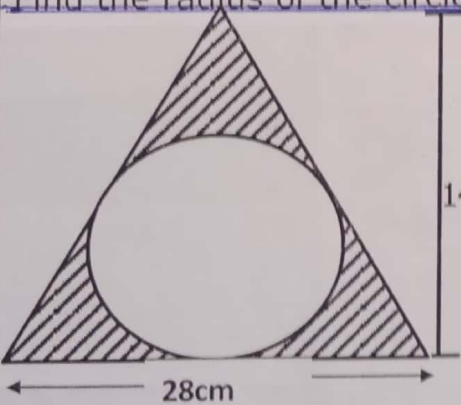
X	2	2	-2	-4
Y	4	4	0	-2

$$\begin{aligned}
 x &= y - 2 \\
 &= 4 - 2 \\
 &= 2
 \end{aligned}$$
  

$$\begin{aligned}
 x &= y - 2 \\
 &= -2 - 2 \\
 &= -4
 \end{aligned}$$

$$\begin{aligned}
 x &= y - 2 \\
 y - 2 &= x \\
 y - 2 + 2 &= x + 2 \\
 y &= x + 2 \\
 &= 2 + 2 \\
 &= 4
 \end{aligned}$$
  

$$\begin{aligned}
 y &= x + 2 \\
 &= -2 + 2 \\
 &= 0
 \end{aligned}$$

29	The number of right angles of a polygon is 12. Calculate the number of sides of a polygon. (2marks)		
	Right-angled method $90(2n-4)$ right angles $(2n-4)$	$(2n-4) = 12$ $2n-4 = 12$ $2n-4+4 = 12+4$ $\frac{2n}{2} = \frac{16}{2}$ $n = 8$	$= 8 \text{ sides}$
b	The sum of interior angles of a regular polygon is $1440^\circ$ . Find the size of each exterior angle. (3marks)		
	interior anglesum $\Rightarrow 90(2n-4)$ $90(2n-4) = 1440$ $180n - 360 = 1440$ $180n - 360 + 360 = 1440 + 360$ $180n = 1800$	$\frac{180n}{180} = \frac{1800}{180}$ $n = 10$ $= 10 \text{ sides}$	Regular decagon Exterior angle $\frac{360^\circ}{10}$ $= 36^\circ$
30	The area of the shaded part in the figure below is $42\text{cm}^2$ . Find the radius of the circle. (4mks)		
		Area of a triangle $\frac{1}{2} \times b \times h$ $\frac{28\text{cm} \times 14\text{cm}}{2}$ $= 196\text{cm}^2$ $196\text{cm}^2 - \pi r^2 = 42\text{cm}^2$ $196\text{cm}^2 - \frac{22r^2}{7} = 42\text{cm}^2$ $7 \times 196 - 22r^2 = 42 \times 7$	$1372 - 22r^2 = 294$ $-22r^2 + 1372 = 294$ $-22r^2 = 294 - 1372$ $-22r^2 = -1078$ $r^2 = \frac{1078}{22}$ $r^2 = 49\text{cm}^2$ $\sqrt{r^2} = \sqrt{49\text{cm}^2}$ $r = 7\text{cm}$



31

An exercise book costs sh. 330. Walugembe uses 12 books every term. How much does Walugembe's father spend on his books in every school year of three terms? (3marks)

$$\text{Shs. } 330 \times 12 \times 3$$

$$\begin{array}{r} 1 \\ 330 \\ \times 12 \\ \hline 660 \\ 3300 \\ \hline 3960 \end{array}$$

$$\text{Shs. } 11,980$$

b)

Bernard had a half loaf of bread. He shared it among his 6 visitors equally. How much did each visitor receive? (2marks)

$$\frac{1}{2} \div 6$$

$$= \frac{1}{12}$$

$$\frac{1}{2} \times \frac{1}{6}$$

32

The sum of three consecutive even numbers is 66. If the middle number is  $m$ , Find the value of  $m$ . (2marks)

1st	2nd	3rd	Total
$m-2$	$m$	$m+2$	66

$$m + m + m = 2 + 2 = 66$$

$$3m = 66$$

$$\frac{3m}{3} = \frac{66}{3}$$

$$m = 22$$

b)

Find their product. (2marks)

$$20, 22, 24$$

$$\begin{array}{r} 24 \\ \times 22 \\ \hline 48 \\ 480 \\ \hline 528 \end{array}$$

$$\begin{array}{r} 148 \\ \times 22 \\ \hline 296 \\ 2960 \\ \hline 3256 \end{array}$$

$$\begin{array}{r} 532 \\ \times 22 \\ \hline 1064 \\ 10640 \\ \hline 11704 \end{array}$$

$$10560$$

\*\*\*End\*\*\*