SECONDARY SCHOOLS FINAL EXAMINATIONS - 2000

Educational Assessment Unit - Education Division

FORM 5 **MATHEMATICS (MENTAL)** **TIME: 15 minutes**

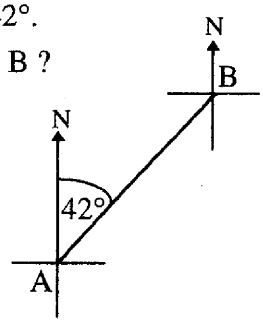
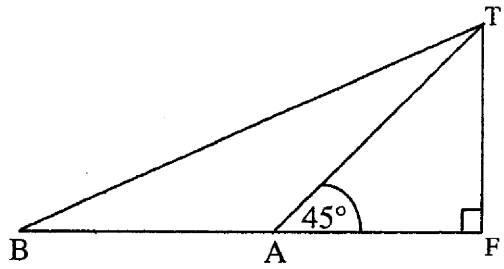
Name _____

Class _____

Mark

- **ANSWER ALL QUESTIONS.**
- **EACH QUESTION CARRIES 1 MARK.**
- **CALCULATORS, RULERS, PROTRACTORS AND OTHER MATHEMATICAL INSTRUMENTS ARE NOT ALLOWED.**
- **IT IS NOT NECESSARY TO SHOW YOUR WORKING. HOWEVER SPACE FOR WORKING IS PROVIDED IF YOU NEED IT.**

	QUESTION	ANSWER	Space for working if required
1.	8 books together cost Lm12·16. 7 similar books cost Lm10·64. What is the cost of 15 such books?	_____	
2.	Write 8253 in standard form.	_____	
3.	A rough estimate for $\frac{608 \times 19{\cdot}6}{203 \times 9{\cdot}75}$ is : **(A)** 0·6 **(B)** 6 **(C)** 60 **(D)** 6000.	_____	
4.	$16 = 4^x$. What is the value of x ?	_____	
5.	Given that $A = \frac{1}{2}C - 2$, find the value of A when $C = 10$.	_____	

6.	Which one is an estimate for the area of a circle of **diameter** 8 cm? $(A = \pi r^2)$ **(A)** 192 cm^2 **(B)** 100 cm^2 **(C)** 50 cm^2 **(D)** 25 cm^2.	_____	
7.	Change Lm7 to US $ at a rate of Lm1 = US $2·31.	_____	
8.	The bearing of B from A is 042°. What is the bearing of A from B ?  	_____	
9.	 In the diagram, which is drawn to scale, angle TBF is about : **(A)** 25° **(B)** 60° **(C)** 50° **(D)** 150°.	_____	
10.	At school the first lesson starts at 8.30 a.m. and finishes at 9.10 a.m. How long does the first lesson last ?	_____	

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FORM 5 **MATHEMATICS (Main Paper)** **TIME: 1 h 45 min**

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Main	Mental	Global Mark
Mark																		

DO NOT WRITE ABOVE THIS LINE

Name _____

Class _____

CALCULATORS ARE ALLOWED
BUT ALL NECESSARY WORKING MUST BE SHOWN

ANSWER ALL QUESTIONS

1. (a) Write 23376 correct to:
   (i) the nearest 10 = _____
   (ii) the nearest 100 = _____

   (b) Change:
   (i) 4·385 kilometres to metres = _____
   (ii) 150 minutes to hours = _____

(4 marks)

2. The top nine marks in a Mathematics test are: 75, 76, 78, 82, 84, 85, 85, 93, 95.
   Work out: (a) the median mark
   (b) the mean mark, giving the answer correct to 2 decimal places.

(4 marks)

3. Solve the equation $\frac{(x-2)}{4} + \frac{x}{3} = 3$.

(4 marks)

4. (a) Calculate the tax on Lm580 at a rate of 5·5%.

(b) Express a length of 80 cm as percentage of 2 m.

(4 marks)

5. Use your calculator to work out the value of $\left(\frac{608\times19\cdot6}{203\times9\cdot75}\right)^2$, giving the answer correct to 2 decimal places.

(4 marks)

6. (a) Calculate the size of an exterior angle of a regular 8 sided polygon.
(b) Work out the size of one of its interior angles.
(c) Hence or otherwise work out the sum of all the interior angles of the polygon.

Sum of interior angles $= (2n-4)\times 90°$ (6 marks)

7. Given that $\mathbf{A} = \begin{pmatrix} 4 & 0 \\ 3 & 1 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 4 & 0 \\ 2 & -6 \end{pmatrix}$, work out the following matrices:

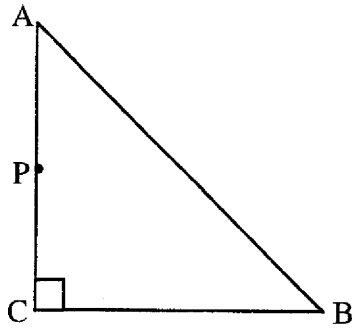
(i) $2\mathbf{A}$ (ii) $\frac{1}{2}\mathbf{B}$ (iii) $2\mathbf{A} - \frac{1}{2}\mathbf{B}$.

(6 marks)

8 (a) The simple interest I is given by the formula $I = \frac{PTR}{100}$. Make P the subject of the formula.

(b) Work out the value of P when $I = £105$, $T = 5$ years and $R = 3\%$ per annum.

(6 marks)

9. 

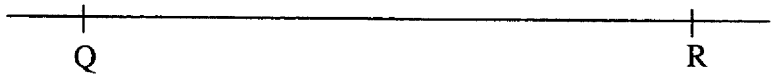
Triangle ABC is right angled at C. P is the mid-point of AC. BC and AC are each 8·6 cm long. Work out :

(a) the length of AB, giving the answer correct to 3 significant figures

(b) angle PBC, giving the answer correct to 1 decimal place.

(6 marks)

10. (a) Construct a triangle PQR in which QR = 8 cm, PQ = 6·5 cm and PR = 7 cm.
(b) Use your protractor to measure angle PRQ and angle QPR.



(6 marks)

11. The radius of a solid metal sphere is 3 cm.
Calculate, giving the answers correct to 3 significant figures :
(a) the volume of the sphere
(b) the weight, **in grams**, of the sphere given that 1 cm^3 of metal weighs 2·6 grams
(c) the total weight of **10** such spheres, giving the answer in **kilograms**.

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

(8 marks)

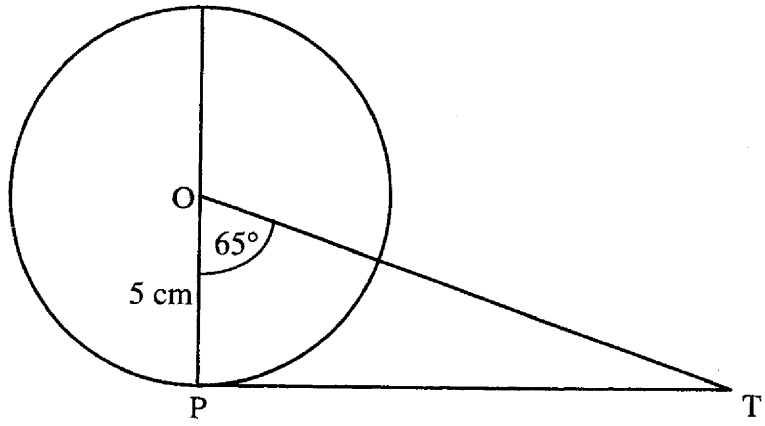
12. A ship leaves port P and sails 80 km due East to bay B. Then it sails from B to harbour H, 60 km away on a bearing of 040°.
(a) Make a scale drawing to show the above information. Use a scale of 1cm to represent 10 km.
(b) Measure the length of PH in cm.
(c) What is the distance from P to H in km ?
(d) Measure and write down the bearing of H from P.

(8 marks)

13. (a) PT is a tangent to a circle centre O and radius 5 cm. Angle POT = 65°.

(i) What is the size of angle OPT ? .

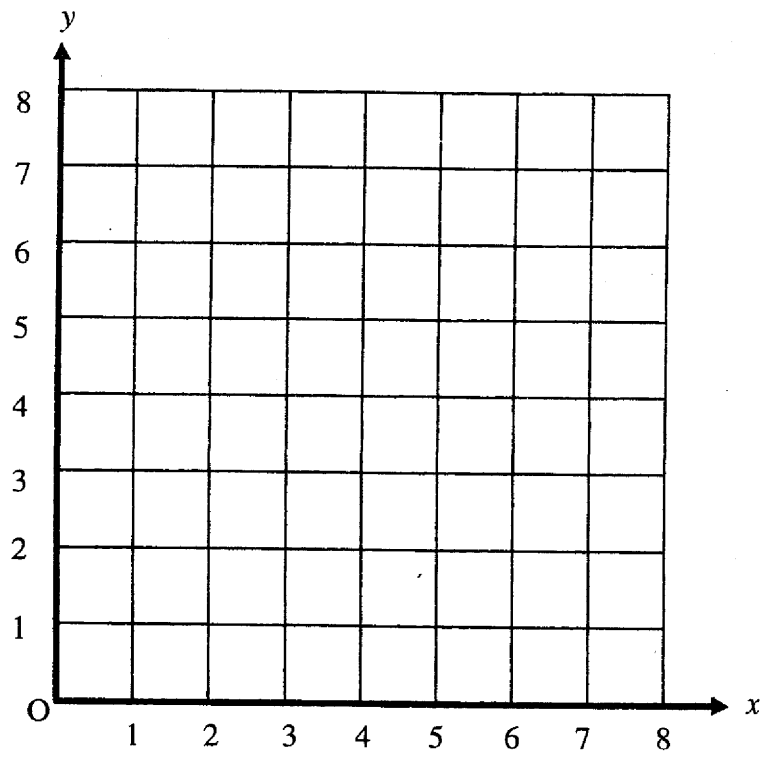
(ii) Calculate the length of PT, giving the answer correct to 3 significant figures.



(b) (i) On the grid below, draw position vectors $\overrightarrow{OA} = \begin{pmatrix} 6 \\ 3 \end{pmatrix}$ and $\overrightarrow{OB} = \begin{pmatrix} 6 \\ 7 \end{pmatrix}$.

(ii) Write the vector $\overrightarrow{AB}$ in the form $\begin{pmatrix} x \\ y \end{pmatrix}$.

(iii) What is the magnitude of $\overrightarrow{AB}$?

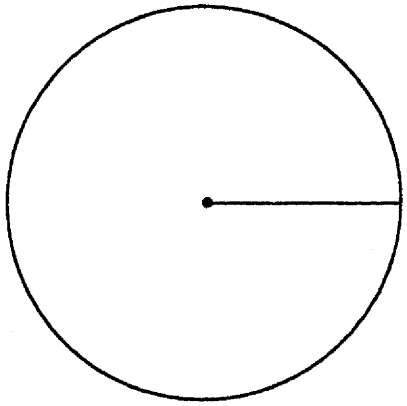


(8 marks)

14. The table shows TV programmes preferred by a group of students.

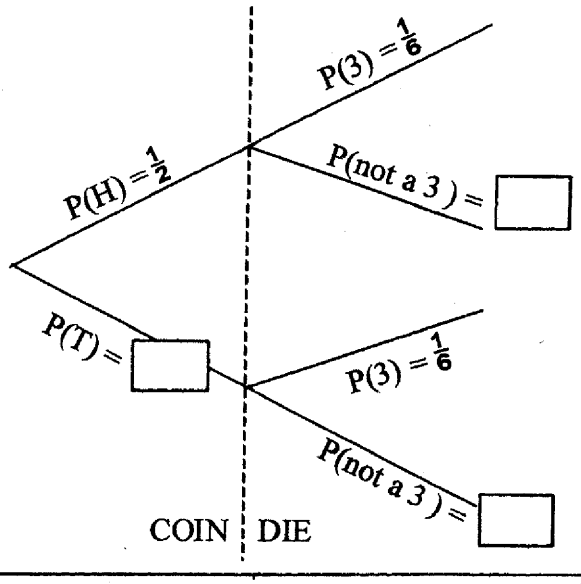
TV Programme	QUIZ	SPORT	CARTOONS	NEWS
Frequency	5	10	12	3

(a) How many students were there in the group ?
(b) Which programme was the most popular ?
(c) Work out the angle at the centre of the pie-chart for each programme.
(d) Complete and label the pie-chart to show the above information.



(8 marks)

15. A coin is tossed to show a head or tail. At the same time a six sided die is rolled.
The tree diagram shows the probability of obtaining a head **(H)** or tail **(T)** on the coin and a **(3)** or **(not a 3)** on the die.
(a) What is the probability of obtaining (i) a tail on the coin, (ii) **(not a 3)** on the die ?
(b) Complete the tree diagram.
(c) Work out the probability of obtaining:
(i) a head and a **(3)**,
(ii) a tail and **(not a 3)**.



(8 marks)