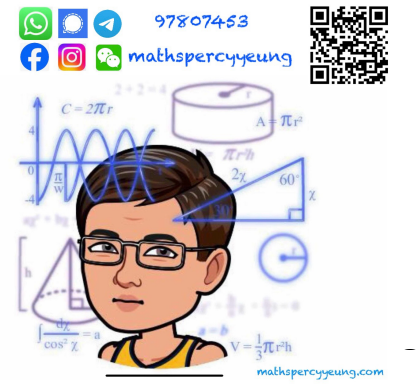
2024-2025 S5
2nd TERM UT
MATH CP
PAPER 2
MC



2024 – 2025
S5 Second Term Uniform Test

MATHEMATICS Compulsory Part

PAPER 2

2nd June, 2025
Time Allowed: 45 minutes
Total Marks: 27

INSTRUCTIONS

1. Read carefully the instructions on the Answer Sheet. After the announcement of the start of the examination, you should insert the information required in the spaces provided.

2. When told to open this book, you should check that all the questions are there. Look for the words '**END OF PAPER**' after the last question.

3. All questions carry equal marks.

4. **ANSWER ALL QUESTIONS**. You should use an HB pencil to mark all your answers on the Answer Sheet, so that wrong marks can be completely erased with a clean rubber. You must mark the answers clearly; otherwise you will lose marks if the answers cannot be captured.

5. You should mark only **ONE** answer for each question. If you mark more than one answer, you will receive **NO MARKS** for that question.

6. No marks will be deducted for wrong answers.

There are 13 questions in Section A and 14 questions in Section B.
The diagrams in this paper are not necessarily drawn to scale.
Choose the best answer for each question.

Section A

1. $\dfrac{(16a)^5}{(2a^{-3})^4} =$
   A. 2^3a^7 .
   B. 2^5a^7 .
   C. $2^{16}a^{17}$.
   D. $2^{19}a^{17}$.

2. $25-(7x+6y)^2 =$
   A. $(5+7x+6y)(5-7x+6y)$.
   B. $(5+7x+6y)(5-7x-6y)$.
   C. $(5+7x-6y)(5-7x+6y)$.
   D. $(5+7x-6y)(5-7x-6y)$.

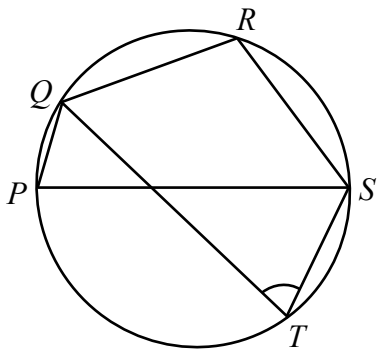
3. Let m and n be constants. If $2x^2+m(x-1)+6 \equiv mx(x+2)+n(x-2)$, then $n =$
   A. -3 .
   B. -2 .
   C. 2 .
   D. 4 .

4. If $3b(4c+1)=(b-2)(5c-1)$, then $c =$
   A. $\dfrac{2-4b}{7b+10}$.
   B. $\dfrac{-2-4b}{7b+10}$.
   C. $\dfrac{7b+10}{2-4b}$.
   D. $\dfrac{-7b-10}{2+4b}$.

5. If $x=15.35$ (correct to 4 significant figures), find the range of values of x .
   A. $15.34 < x \le 15.36$
   B. $15.34 \le x < 15.36$
   C. $15.345 < x \le 15.355$
   D. $15.345 \le x < 15.355$

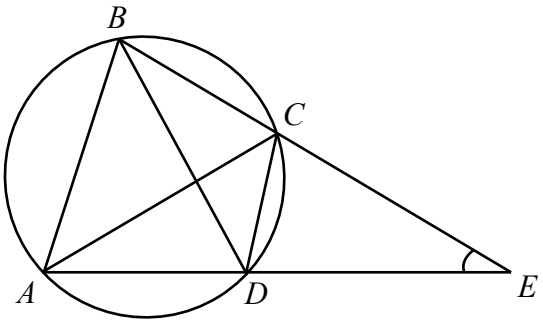
6. The solution of $-2x < 28 < -7x$ is
   A. $x < -14$.
   B. $x > -4$.
   C. $-14 < x < -4$.
   D. $x < -14$ or $x > -4$.

7. In the figure, PS is a diameter of the circle $PQRST$. If $QR = RS$ and $\angle PQR = 126°$, then $\angle QTS =$



   A. $54°$.
   B. $60°$.
   C. $72°$.
   D. $78°$.

8. In the figure, $ABCD$ is a circle. BC produced and AD produced meet at the point E. It is given that $AC = CE$, $\angle ABD = 44°$ and $\angle BAC = 40°$. Find $\angle DEC$.



A. 32°
B. 42°
C. 46°
D. 50°

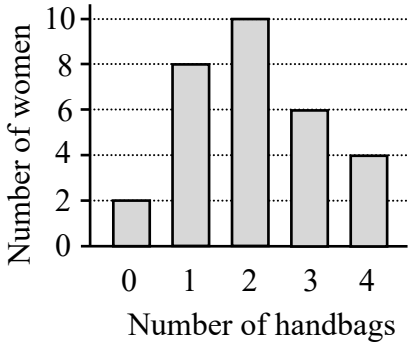
9. The coordinates of the centre of the circle C are $(-6, 12)$. If C cuts the x-axis at the points U and V such that $UV = 10$, then the equation of C is
A. $x^2 + y^2 - 12x + 24y + 1 = 0$.
B. $x^2 + y^2 + 12x - 24y + 1 = 0$.
C. $x^2 + y^2 - 12x + 24y + 11 = 0$.
D. $x^2 + y^2 + 12x - 24y + 11 = 0$.

10. It is given that A and B are two distinct points lying on the circle $x^2 + y^2 + 8x - 4y - 120 = 0$. Let P be a moving point in the rectangular coordinate plane such that $AP = BP$. The equation of the locus of P is $5x - 2y + k = 0$, where k is a constant. Find k.
A. –24
B. –16
C. 16
D. 24

11. The equations of the straight lines L_1 and L_2 are $4x - 3y - 6 = 0$ and $4x - 3y + 5 = 0$ respectively. Let P be a moving point in the rectangular coordinate plane such that the perpendicular distance from P to L_1 is equal to the perpendicular distance from P to L_2. Find the equation of the locus of P.
A. $8x - 6y - 1 = 0$
B. $8x - 6y + 1 = 0$
C. $6x - 8y - 1 = 0$
D. $6x - 8y + 1 = 0$

12. The mean weight of 12 cats is 5.9 kg. If the mean weight of 4 of these 12 cats is 6.1 kg, then the mean weight of the remaining 8 cats is
A. 5.5 kg .
B. 5.65 kg .
C. 5.7 kg .
D. 5.8 kg .

13. The bar chart below shows the distribution of the numbers of handbags owned by the women in a group. Find the standard deviation of the distribution correct to 2 decimal places.



A. 1.01
B. 1.12
C. 1.26
D. 2.07

Section B

14. Let k be a constant. Find the range of values of k such that $x^2+kx+k+8\geq 0$ for any real number x .

A. $k\leq -8$ or $k\geq 4$

B. $k\leq -4$ or $k\geq 8$

C. $-8\leq k\leq 4$

D. $-4\leq k\leq 8$

15. Consider the following system of inequalities:

$$\begin{cases} x\leq 11 \\ 4x+5y-19\geq 0 \\ 7x-6y+11\leq 0 \end{cases}$$

Let D be the region which represents the solution of the above system of inequalities. If (x, y) is a point lying in D, then the greatest value of $8x-6y+11$ is

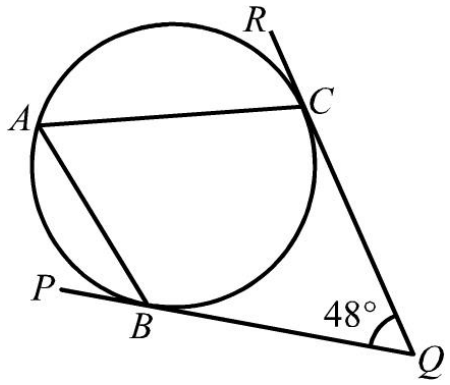
A. 1 .

B. 11 .

C. 15 .

D. 129 .

16. In the figure, *ABC* is a circle. *PQ* and *RQ* are the tangents to the circle at *B* and *C* respectively. If $\angle RQP = 48°$, $\angle BAC =$



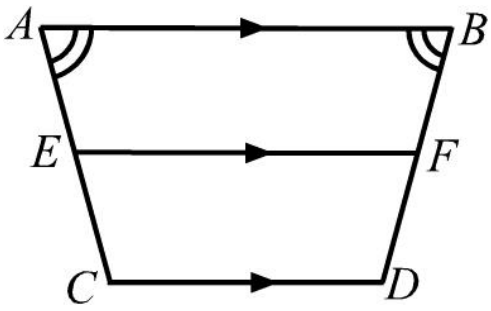
A. 24° .

B. 48° .

C. 66° .

D. 68° .

17. In the figure, *AB* // *EF* // *CD*. *AEC* and *BFD* are straight lines. If $\angle BAC = \angle ABD$, Which of the following quadrilaterals must be a cyclic quadrilateral?



I. *AEFB*

II. *ACDB*

III. *ECDF*

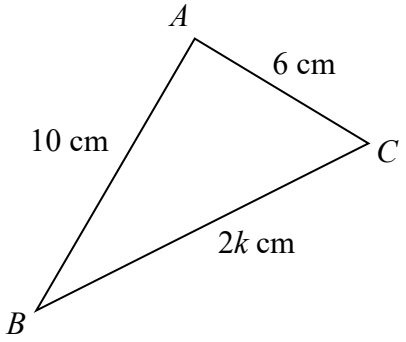
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

18. In the figure, the area of ΔABC =



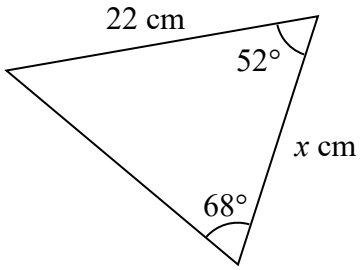
A. $\sqrt{(k^2-4)(64-k^2)}\,\text{cm}^2$.

B. $\sqrt{(k^2+4)(64+k^2)}\,\text{cm}^2$.

C. $\sqrt{(k^2-4)(64+k^2)}\,\text{cm}^2$.

D. $\sqrt{(k^2+4)(64-k^2)}\,\text{cm}^2$.

19. In the figure, find x correct to the nearest integer.



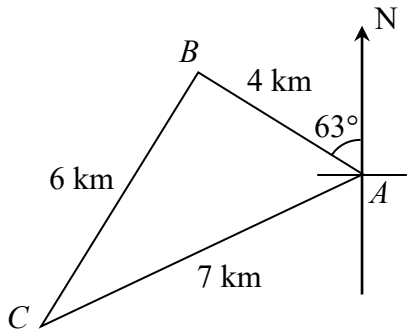
A. 20

B. 21

C. 22

D. 23

20. In the figure, A, B and C lie on the same horizontal ground. Find the true bearing of C from A, correct to the nearest degree.



A. 059°

B. 122°

C. 238°

D. 297°

21. The base ABC of the right pyramid $VABC$ is an equilateral triangle. Let θ be the angle between the plane VAB and the plane ABC. If $\tan\theta = 2$ and $VA = 4$ cm, find the volume of the pyramid $VABC$.

A. $4\sqrt{3}\,\text{cm}^3$

B. $4\sqrt{6}\,\text{cm}^3$

C. $6\sqrt{3}\,\text{cm}^3$

D. $6\sqrt{6}\,\text{cm}^3$

22. The straight line $hx+ky=6$ and the circle $x^2+y^2-8x-4y-18=0$ intersect at the points A and B, where h and k are constants. If the coordinates of the mid-point of AB are $(1,0)$, find k .

A. 12

B. 9

C. 6

D. 4

23. Find the range of values of c such that the circle $x^2+y^2+4x-2y-3=0$ and the straight line $y=x+c$ intersect at two distinct points.

A. $-1<c<7$

B. $-1\le c\le 7$

C. $c<-1$ or $c>7$

D. $c\le -1$ or $c\ge 7$

24. There are 9 boys and 12 girls in a swimming club. 6 members of the club are chosen to form a team. Suppose there is at least one boy in the team. How many different ways are there in forming the team?

A. 7 128
B. 47 136
C. 53 340
D. 54 264

25. A queue is formed by 2 managers and 7 officers. If no managers are next to each other, how many different queues can be formed?

A. 80 640
B. 141 120
C. 282 240
D. 362 880

26. Jessica obtains 84 marks in a Mathematics competition. If the mean of the scores of the Mathematics competition is 60 marks and her standard score in the competition is 2, then the standard deviation of the scores of the Mathematics competition is

A. 6 marks.
B. 12 marks.
C. 24 marks.
D. 48 marks.

27. Let m_1, r_1 and v_1 be the median, the range and the variance of a group of numbers $\{n_1, n_2, n_3, n_4, n_5, n_6\}$ respectively while m_2, r_2 and v_2 be the median, the range and the variance of a group of numbers $\{4n_1, 4n_2, 4n_3, 4n_4, 4n_5, 4n_6\}$ respectively. Which of the following must be true?

I. $m_2 = 4m_1$
II. $r_2 = 4r_1$
III. $v_2 = 4v_1$

A. I and II only
B. I and III only
C. II and III only
D. I, II and III

END OF PAPER