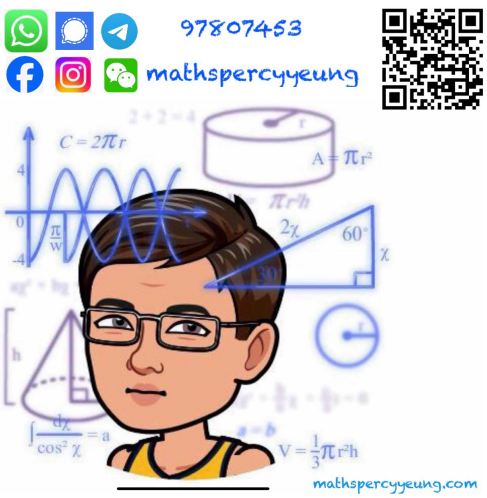
2024-2025 S5
1st TERM UT
MATH CP
PAPER 2

MC



2024 – 2025
S5 First Term Uniform Test

MATHEMATICS Compulsory Part

PAPER 2

29th October, 2024
10:50 am – 11:30 am (40 minutes)
Total Marks: 24

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.

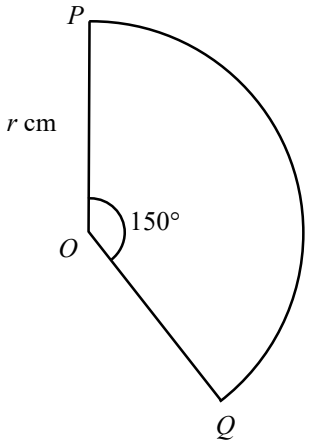
5. You should mark only **ONE** answer for each question. If you mark more than one answer, you will receive **NO MARKS** for that question.

6. No marks will be deducted for wrong answers.

There are 16 questions in Section A and 8 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. In the figure, OPQ is a sector of radius r cm. If $\angle POQ = 150°$ and the area of the sector is 15π cm^2, then $r =$



A. 1.
B. 3.
C. 6.
D. 18.

2. The solution of $\frac{2x-5}{3} \geq x-4$ or $7x+8<1$ is

A. $x > -1$.
B. $x < -1$.
C. $x \leq 7$.
D. $x \geq 7$.

3. Let a be a constant. Solve the equation $(x-5a)^2 = 4a^2$.

A. $x = 9a$
B. $x = 7a$
C. $x = a$ or $x = 9a$
D. $x = 3a$ or $x = 7a$

4. If $f(x) = x^2 - 3x + 5$, then $f(-3a) =$

A. $3a^2 + 9a + 5$.
B. $-9a^2 + 9a + 5$.
C. $9a^2 - 9a + 5$.
D. $9a^2 + 9a + 5$.

5. Let $f(x) = x^3 + ax^2 - 2x - 4$, where a is a constant. If $f(x)$ is divisible by $x + a$, find the remainder when $f(x)$ is divided by $x - 1$.

A. -3
B. -2
C. -1
D. 2

6. Which of the following statements about the graph of $y = 12 - (x + 9)^2$ is true?

A. The y-intercept of the graph is 12.
B. The graph opens upwards.
C. The graph cuts the x-axis.
D. The graph passes through the origin.

7. It is given that r varies as the cube of p and the square of q. When $p = 1$ and $q = 6$, $r = 20$. When $p = -3$ and $q = 2$, $r =$

A. -60.
B. -40.
C. 40.
D. 60.

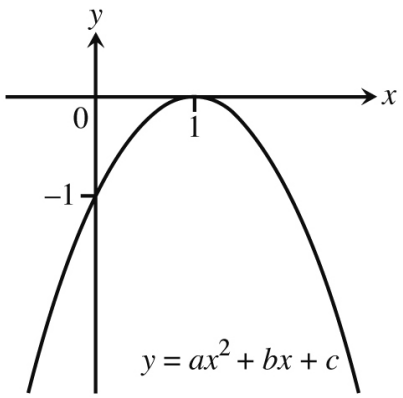
8. It is given that z varies inversely as x and directly as the square root of y. If x is increased by 25% and y is decreased by 36%, then z

A. is increased by 48%.
B. is increased by 52%.
C. is decreased by 36%.
D. is decreased by 64%.

9. If k is a constant such that the quadratic equation $2x^2 - kx + 8 = 0$ has no real roots, find the range of the values of k.

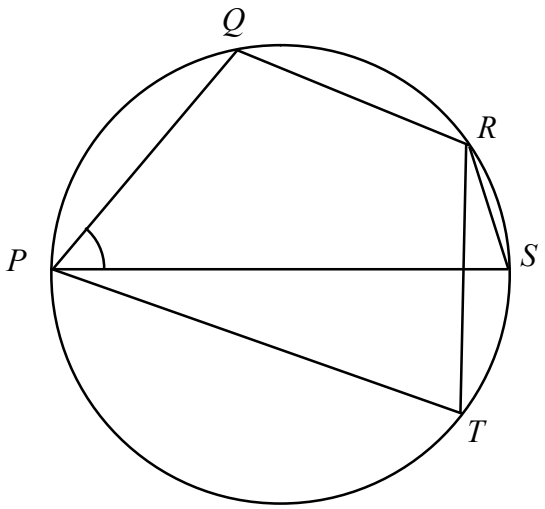
A. $k < -8$ or $k > 8$
B. $-8 < k < 8$
C. $0 < k < 8$
D. No real solutions

10. The figure shows the graph of $y = ax^2 + bx + c$, where a, b and c are constants. Solve $ax^2 + bx + c > 0$.



A. All real numbers
B. All real numbers except $x = 1$
C. $x = 1$
D. No real solutions

11. In the figure, PS is a diameter of the circle $PQRST$. If $\angle PTR = 66°$ and $\overset{\frown}{QR} = 2\overset{\frown}{RS}$, then $\angle QPS =$



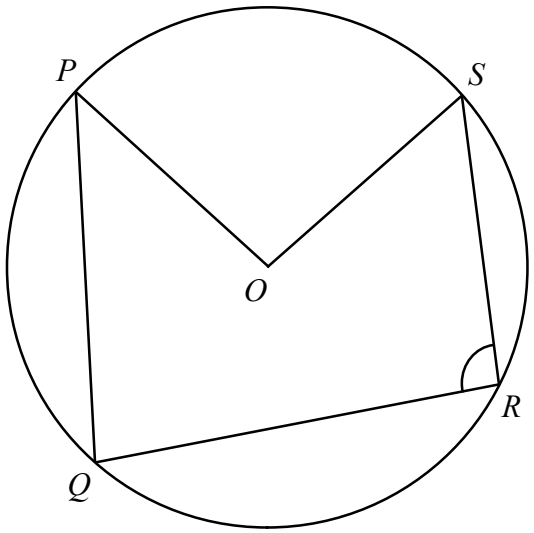
A. 36°.

B. 45°.

C. 50°.

D. 72°.

12. In the figure, O is the centre of the circle $PQRS$. If $\angle OPQ = 54°$, $\angle PQR = 82°$ and $\angle OSR = 70°$, then $\angle QRS =$



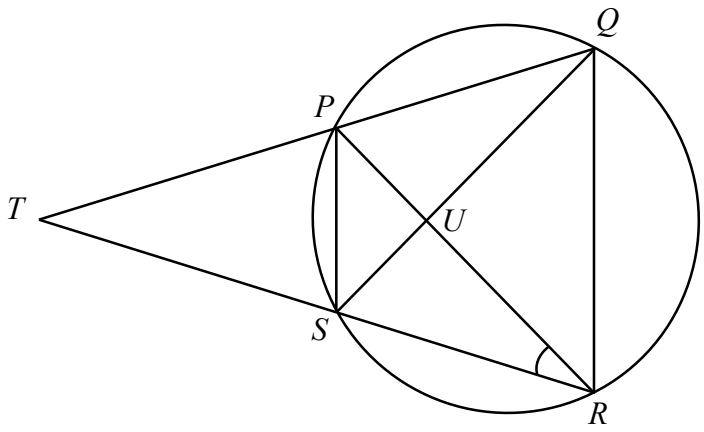
A. 90°.

B. 94°.

C. 98°.

D. 126°.

13. In the figure, $PQRS$ is a circle. QP produced and RS produced meet at the point T. It is given that $QU = RU$, $\angle QTR = 34°$ and $\angle QRU = 46°$. Find $\angle PRT$.



A. 27°

B. 36°

C. 48°

D. 54°

14. $[\sin(270° - \theta) + 1][\cos(180° - \theta) - 1] =$

A. $-\cos^2\theta$.

B. $-\sin^2\theta$.

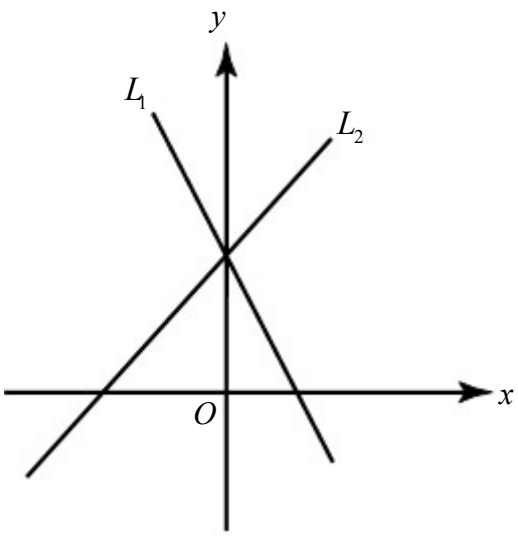
C. $\cos^2\theta$.

D. $\sin^2\theta$.

15. If straight lines L_1: $ax - 4y - 17 = 0$ and L_2: $15x - 20y - 21 = 0$ have no points of intersection. Find the value of a.

A. –3
B. 3
C. –5
D. 5

16. In the figure, the two straight lines $L_1 : y = ax + b$ and $L_2 : y = cx + d$ intersect at a point on the positive y-axis. Which of the following are true?



I. $b = d$
II. $cd > 0$
III. $bc < ad$

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

Section B

17. The H.C.F. of a^3b^2, a^2bc and a^4b^5c is

A. $a^9b^8c^2$.
B. a^4b^5c.
C. a^2bc.
D. a^2b.

18. If $\begin{cases} \alpha^2 - 5\alpha - 4 = 0 \\ 4\beta^2 - 10\beta - 4 = 0 \end{cases}$ where $\alpha \neq 2\beta$, find the value of $2\alpha\beta$.

A. –8
B. –4
C. –2
D. –1

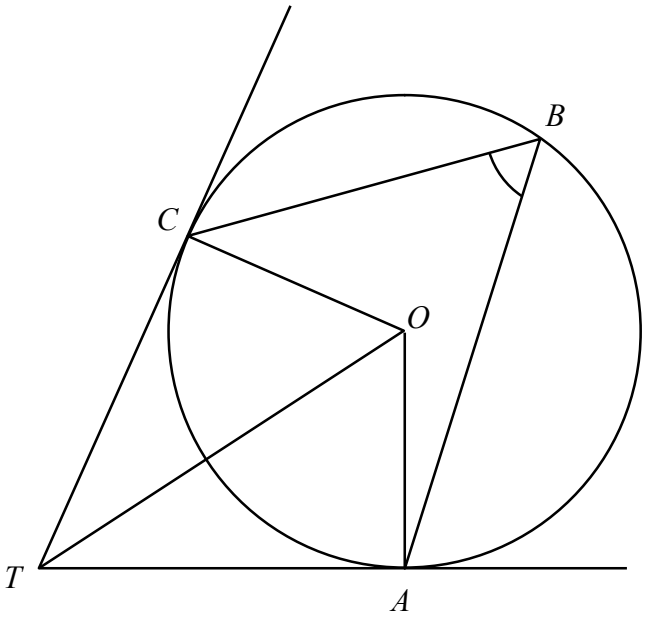
19. If a is a real number, then the real part of $(2a - 4i)(ai - 3)$ is

A. $-2a$.
B. $-10a$.
C. $2a^2 + 12$.
D. $2a^2 - 12$.

20. For $0° \le x \le 360°$, how many distinct real roots does the equation $3\sin^2 x = \sin x$ have?

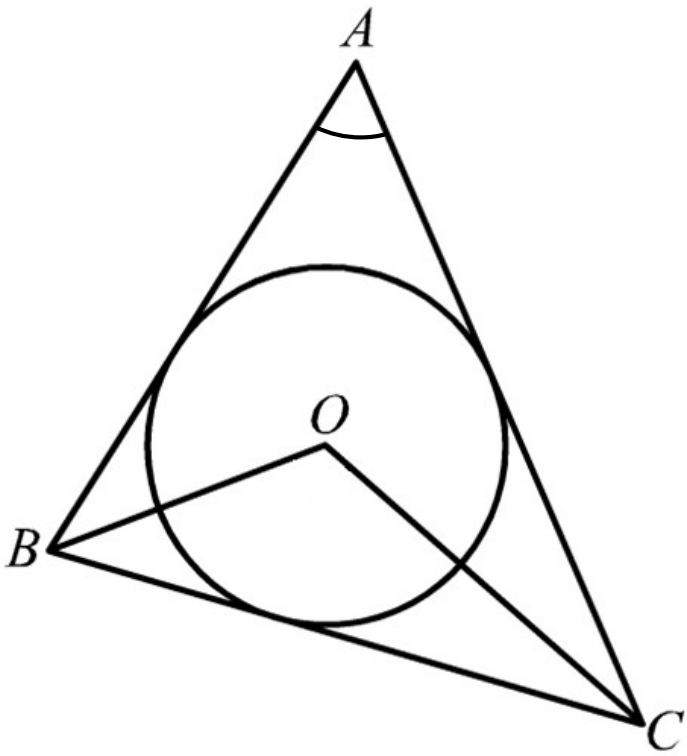
A. 2
B. 3
C. 4
D. 5

21. In the figure, O is the centre of the circle. TA and TC are tangents to the circle at A and C respectively. Given that $\angle OTA = 33°$. Find $\angle ABC$.



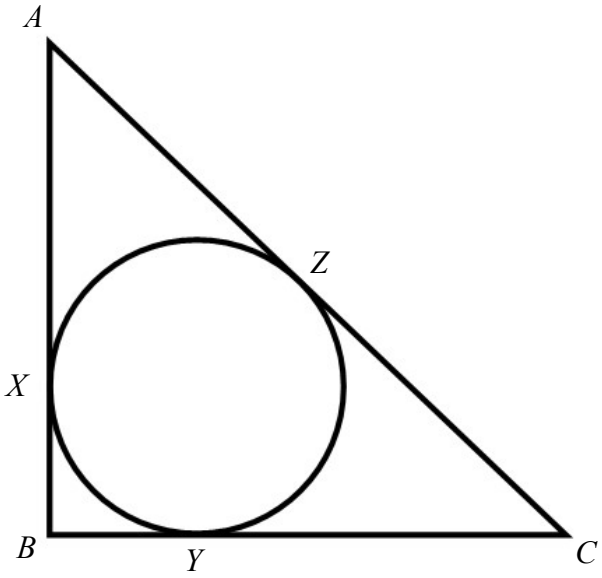
A. 33°
B. 57°
C. 66°
D. 114°

22. In the figure, a circle with centre O is inscribed in ΔABC. If $\angle BOC = 118°$, find $\angle BAC$.



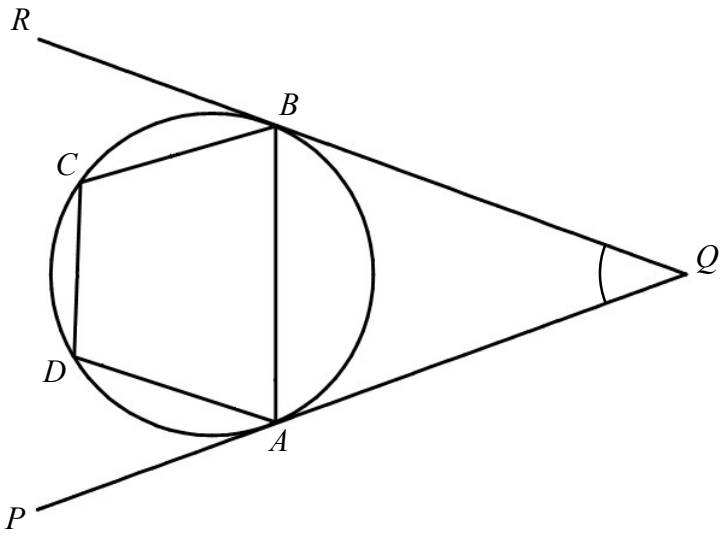
A. 31°
B. 56°
C. 59°
D. 62°

23. In the figure, a circle is inscribed in ΔABC, where X, Y and Z are points of contact. AX = 14 cm, CZ = 15 cm and $\angle ABC = 90°$. Find the radius of the circle.



A. 6 cm
B. 7 cm
C. 8 cm
D. 10 cm

24. In the figure, PQ and QR are the tangents to the circle at two points A and B respectively. If $BC = CD$, $\angle BAD = 76°$ and $\angle ADC = 106°$, find $\angle AQB$.



A. 30°
B. 40°
C. 44°
D. 53°

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