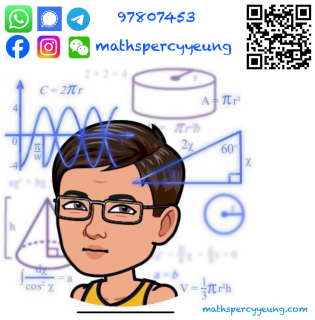
2023-2024 S3
1st TERM UT 2
MATH
MC



2023 – 2024
S3 First Term Uniform Test 2

MATHEMATICS

14th December, 2023
Time Allowed: 30 minutes
Total Marks: 23

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.

7. The diagrams in this paper are not necessarily drawn to scale.

8. Calculators with 'H.K.E.A.A. Approved' can be used.

Choose the best answer for each question.

1. $-a+4b+5a^2-18ab-8b^2=$
   A. $(a-4b)(5a+2b-1)$.
   B. $(a-4b)(5a+2b+1)$.
   C. $(a+4b)(5a-2b-1)$.
   D. $(a+4b)(5a-2b+1)$.

2. Simplify $\left(\frac{x^3}{-y^4}\right)^5$.
   A. $-\frac{x^8}{y^9}$
   B. $-\frac{x^{15}}{y^{20}}$
   C. $\frac{x^8}{y^9}$
   D. $\frac{x^{15}}{y^{20}}$

3. $27^{333}\times 5^{999}=$
   A. 15^{999} .
   B. 15^{1332} .
   C. 135^{999} .
   D. 135^{1332} .

4. 0.000 014 95 =
   A. 1.49×10^{-5} . (cor. to 3 sig. fig.)
   B. 1.50×10^{-5} . (cor. to 3 sig. fig.)
   C. 1.5×10^{-5} . (cor. to 3 sig. fig.)
   D. 1.50×10^{-6} . (cor. to 3 sig. fig.)

5. $1000000010101_2=$
   A. $2^{11}+21$.
   B. $2^{11}+42$.
   C. $2^{12}+21$.
   D. $2^{12}+42$.

6. The width and the length of a rectangle are measured as 3 cm and 5 cm respectively, correct to the nearest cm. Let x cm^2 be the actual area of the rectangle. Find the range of values of x.
   A. $11.25 \le x < 19.25$
   B. $11.25 < x \le 19.25$
   C. $14.5 \le x < 15.5$
   D. $14.5 < x \le 15.5$

7. If p and q are constants such that $(x-5)(x+p)-9\equiv(x-7)^2-q$, then $q=$
   A. -19 .
   B. -9 .
   C. 13 .
   D. 37 .

8. $\frac{2a^2-2b^2}{a-b}=$
   A. $a-b$.
   B. $a+b$.
   C. $2(a+b)$.
   D. $2(a-b)$.

9. Factorize $42 + 13w + w^2$.
   A. $(w - 3)(w - 14)$
   B. $(w - 6)(w - 7)$
   C. $(w + 6)(w + 7)$
   D. $(w + 3)(w + 14)$

10. Which of the following is/are the factor(s) of $12x^4-8x^3-32x^2$?
    I. $x + 2$
    II. $x - 2$
    III. $3x + 4$

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

11. If $p \geq q$, which of the following must be true?

I. $p + 9 \geq q + 9$

II. $p - 2 \geq q - 2$

III. $-\frac{p}{5} \leq -\frac{q}{5}$

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

12. The smallest integer that satisfies the inequality $3 - \frac{2-x}{4} > \frac{7}{2}$ is

A. 3 .
B. 4 .
C. 5 .
D. 6 .

13. Miss Chan has 300 candies. She distributes the candies to S3A and S3B students so that each student in S3A has x candies and each student in S3B has $(x - 2)$ candies. If the numbers of students in S3A and S3B are 25 and 20 respectively, which of the following inequalities can be used to find the range of values of x?

A. $20x + 25(x - 2) \leq 300$
B. $25x + 20(x - 2) \leq 300$
C. $20x + 25(x - 2) > 300$
D. $25x + 20(x - 2) > 300$

14. Alice deposited \$$P$ in a bank at an interest rate of r% p.a. compounded quarterly for 4 years. The amount received by Alice is

A. $\$P\left(1+\frac{r\%}{4}\right)^{16}$.
B. $\$P\left(1+\frac{r\%}{4}\right)^{4}$.
C. $\$P(1+r\%)^{16}$.
D. $\$P(1+r\%)^{4}$.

15. Refer to the progressive tax rates as shown below.

Net chargeable income	Tax rate
On the first \$50 000	2%
On the next \$50 000	6%
On the next \$50 000	10%
On the next \$50 000	14%
Remainder	17%

Ryan's annual income is \$478 000. If his allowance is \$205 000, how much salaries tax should he pay?

A. \$27 300
B. \$28 410
C. \$38 200
D. \$46 410

16. The production of a toy factory increased at a constant rate of 4% per year. If the factory produced 54 080 toys in 2021, how many toys were produced in 2019?

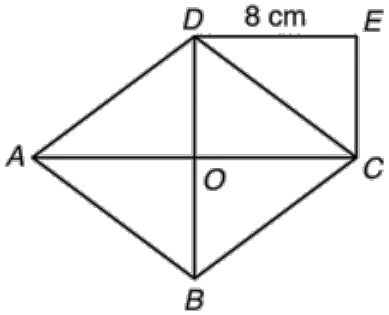
A. 50 000
B. 52 000
C. 56 243 (cor. to the nearest integer)
D. 58 493 (cor. to the nearest integer)

17. If 300 kg is decreased by 20% and then increased by 20%, find the new weight.

A. 278 kg
B. 288 kg
C. 298 kg
D. 300 kg

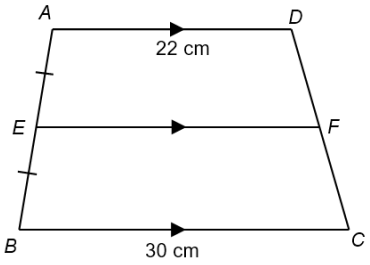
18. In the figure, $ABCD$ is a rhombus and $DOCE$ is a rectangle. If the perimeter of $DOCE$ is 28 cm, find the perimeter of $ABCD$.

A. 24 cm
B. 30 cm
C. 36 cm
D. 40 cm

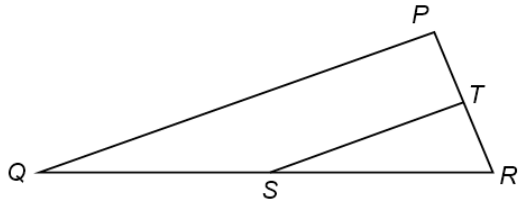


19. In the figure, E is the mid-point of AB and DFC is a straight line. Given that $AD//EF//BC$, find the length of EF.

A. 24 cm
B. 25 cm
C. 26 cm
D. 27 cm



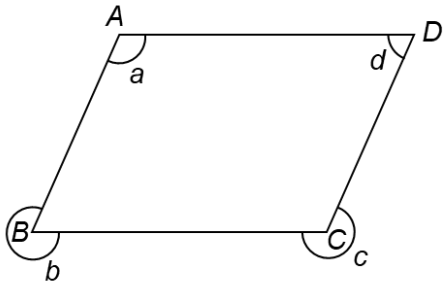
20. In the figure, S and T are points on QR and PR respectively such that ST is the perpendicular bisector of PR.



If $PR = 20$ cm and $RS = 26$ cm, then $ST =$

A. 20 cm.
B. 21 cm.
C. 22 cm.
D. 24 cm.

21. In the figure, $ABCD$ is a parallelogram.

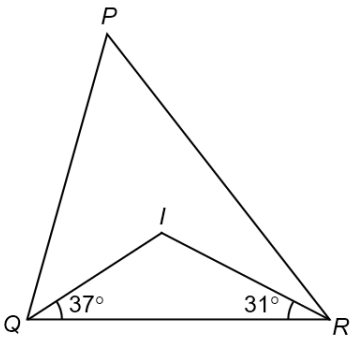


Which of the following must be true?

I. $a + d = 180°$
II. $a + c = 360°$
III. $b + c = 540°$

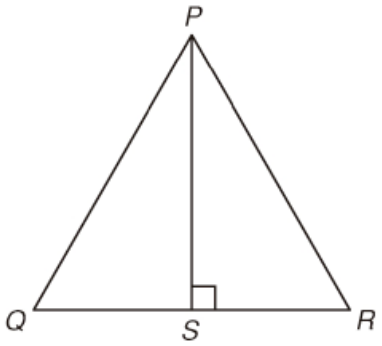
A. I and II only
B. I and III only
C. II and III only
D. I, II and III

22. In the figure, I is the incentre of $\triangle PQR$. $\angle IQR = 37°$ and $\angle IRQ = 31°$. Find $\angle QPR$.



A. 34°
B. 44°
C. 62°
D. 68°

23. In the figure, $PS \perp QR$ and PS is the angle bisector of $\angle QPR$.



Which of the following are true?

I. PS is an altitude of $\triangle PQR$.
II. PS is a median of $\triangle PQR$.
III. PS is a perpendicular bisector of $\triangle PQR$.

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

END OF PAPER