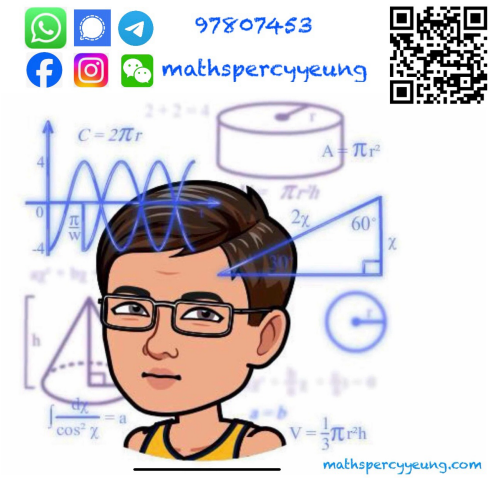
2023-2024 S1
2nd TERM EXAM
MATH



2023 – 2024
S1 Second Term Examination

MATHEMATICS

Question–Answer Book

14th June, 2024
8:15 am – 9:45 am (1 hour 30 minutes)
This paper must be answered in English

INSTRUCTIONS

1. Write your name, class and class number in the spaces provided on this cover.

2. Answer ALL questions in Section A. You should use an HB pencil to mark all the 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. You should mark only ONE answer for each question. If you mark more than one answer, you will receive NO MARKS for that question.

3. Attempt ALL questions in Sections B and C. Write your answers in the spaces provided in this Question – Answer Book.

4. Unless otherwise specified, all working must be clearly shown.

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

6. NO calculator is allowed.

Sections	Marks
A Total	**/30**
B Total	**/40**
C Total	**/30**
TOTAL	**/100**

Section A (30 marks)

Choose the best answer for each question.

1. Which of the following is greater than –3.3 ?
   A. –3.9
   B. $-3\frac{1}{2}$
   C. $-3\frac{1}{3}$
   D. $-3\frac{1}{5}$

2. Which of the following is incorrect?
   A. $(-a)-(-a)=0$
   B. $-(-b)+(-b)=-2b$
   C. $(-a)(-b)=ab$
   D. $(+a)\div(-b)=-\frac{a}{b}$

3. Subtract p from q, and then multiply half of the difference by r. The result is
   A. $p-\frac{qr}{2}$.
   B. $q-\frac{pr}{2}$.
   C. $\frac{(p-q)r}{2}$.
   D. $\frac{(q-p)r}{2}$.

4. Which of the following estimations has used rounding down as the estimation strategy?
   A. $26.7+34.3+80.2\approx 27+24+80$
   B. $8.9+18.6+20.5\approx 8+18+20$
   C. $20.9+17.8+34.2\approx 21+18+35$
   D. $40.1+69.2+78.6\approx 40+70+80$

5. Using index notation, express the number 360 as a product of prime factor.
   A. $6^2\times 10$
   B. $3^3\times 5^2$
   C. $2^3\times 3^2\times 5$
   D. $2^2\times 3^3\times 5$

6. The L.C.M. of 60 and 440 is
   A. $2^2\times 5$.
   B. $2^3\times 3\times 5$.
   C. $2^3\times 3\times 5\times 11$.
   D. $2^5\times 3\times 5^2\times 11$.

7. It is given that the n^{th} term of a sequence is $4(n-3)$. Find the product of the 2nd term and the 4th term.
   A. –16
   B. –8
   C. 0
   D. 16

8. A sum of \$350 is shared among George, Mark and Tom. If the amount George gets is twice as much as that Mark gets, and the amount Mark gets is twice that Tom gets, which of the following equations can help us to find the amount they get?
   I. $x(2x)(4x)=350$
   II. $y+2y+4y=350$
   III. $z+\frac{z}{2}+\frac{z}{4}=350$
   A. I only
   B. II only
   C. III only
   D. II and III only

9. Which of the following may represent the n^{th} term of the sequence $0, \frac{1}{7}, \frac{2}{9}, \frac{3}{11}, \frac{4}{13}, \cdots$?

A. $\frac{n}{n+5}$

B. $\frac{n-1}{n+5}$

C. $\frac{n}{2n+3}$

D. $\frac{n-1}{2n+3}$

10. For the algebraic expression $3x^2y-6x+4yx^2-5xy^2-6y-7$, which of the following is true?

A. $3x^2y$ and $4yx^2$ are like terms.

B. The number of terms is 5.

C. The constant term is 7.

D. The degree of the polynomial is 2.

11. The weight of a man decreases from 54 kg to 48 kg. Find the percentage decrease in weight.

A. $11\frac{1}{9}\%$

B. 12.5%

C. 25%

D. 87.5%

12. If the selling price of a TV set is \$4160 with a discount 20%, find its marked price.

A. \$ 832

B. \$ 3 328

C. \$ 4 992

D. \$ 5 200

13. Solve the equation $\frac{7d}{3}-d=8$.

A. $d=-6$

B. $d=-4$

C. $d=4$

D. $d=6$

14. Simplify $2a^3-5+3a^2+3-4a^2+6a^2$.

A. $2a^3-7a^2-8$

B. $2a^3+5a^2-2$

C. $2a^3-7a^2-2$

D. $2a^3+5a^2-8$

15. The length and the width of a rectangle are $(6a-b)$ cm and $(2a+3b)$ cm respectively. The perimeter of the rectangle is

A. $(8a+2b)$ cm .

B. $(8a-4b)$ cm .

C. $(16a+4b)$ cm .

D. $(16a-8b)$ cm .

16. Which of the following solids has uniform cross-sections?

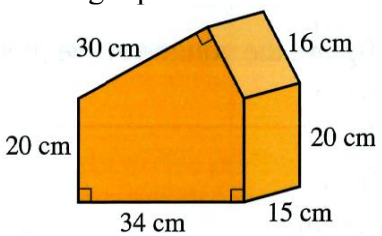
A. Cylinder

B. Cone

C. Pyramid

D. Sphere

17. In the figure, the total area of the lateral faces of the right prism is



A. 1 500 cm^2 .

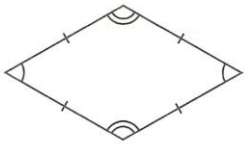
B. 1 800 cm^2 .

C. 2 960 cm^2 .

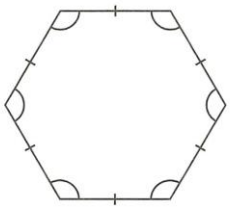
D. 5 280 cm^2 .

18. Which of the following is/are regular polygon(s)?

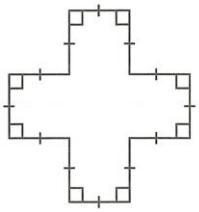
I.



II.

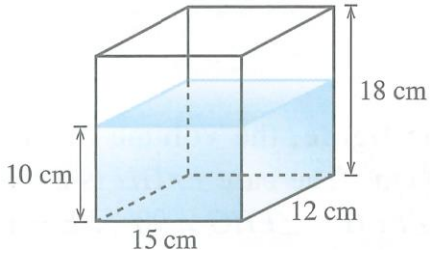


III.



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

19. 4 identical metal statues were totally immersed in the water in a rectangular container. When the 4 statues are taken out, the water level decreases from 18 cm to 10 cm as shown in the figure. The volume of each metal statue is

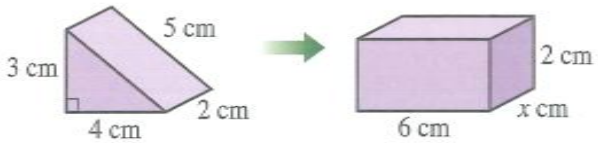


A. 360 cm^3 .
B. 450 cm^3 .
C. 810 cm^3 .
D. 1440 cm^3 .

20. $5p^3q^2 \times 5p^4q^5 =$
A. $10p^7q^7$.
B. $10p^{12}q^{10}$.
C. $25p^7q^7$.
D. $25p^{12}q^{10}$.

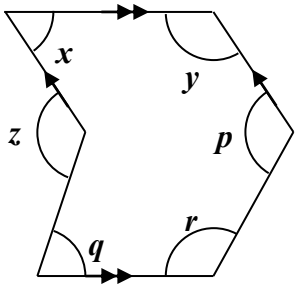
21. Round off 129.46727 to 4 significant figures.
A. 129.4
B. 129.5
C. 129.4672
D. 129.4673

22. In the figure, a solid triangular prism is melted and recast into a cuboid. Find the value of x.



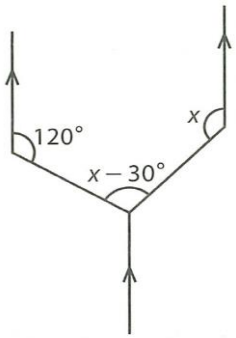
A. 0.75
B. 1
C. 1.25
D. 2

23. Which of the following may not be correct?



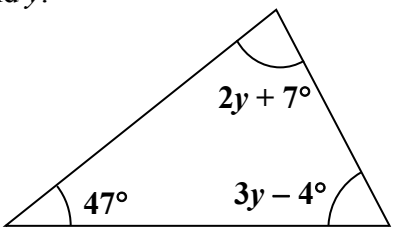
A. $x+q=z$
B. $x+r=p$
C. $x+y=180°$
D. $p+y+r=360°$

24. In the figure, x =



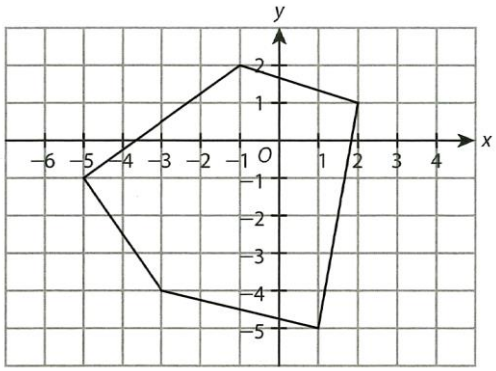
A. 105°.
B. 120°.
C. 135°.
D. 150°.

25. Find y.



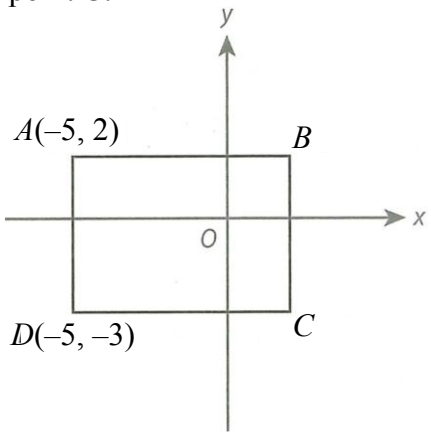
A. 23°
B. 24°
C. 25°
D. 26°

26. In the figure, which of the following point lies inside the pentagon?



A. (–3, 2)
B. (2, –3)
C. (1, –3)
D. (–3, 1)

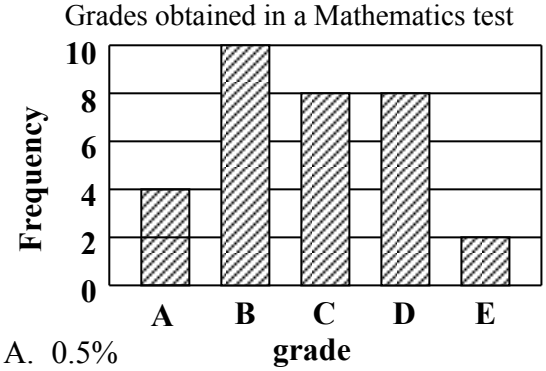
27. In the figure, the perimeter of the rectangle is 24 units. Find the coordinates of point C.



A. (2, –3)
B. (3, –2)
C. (1, –3)
D. (1, –2)

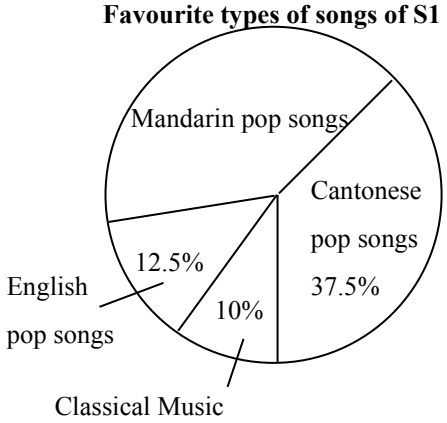
28. Find the distance between points $P(h, -3)$ and $Q(h, 4)$.
A. 1 unit.
B. 7 units.
C. 12 units.
D. Cannot be determined.

29. The bar chart below shows the distribution of the grades obtained by the students of a class in a Mathematics test. Find the percentage of the students who obtained grade C or D.



A. 0.5%
B. 5%
C. 16%
D. 50%

30. The following pie chart shows the favourite types of songs of S1 students. Find the angle of the sector representing "Mandarin pop songs'.



A. 36°
B. 40°
C. 144°
D. 320°

Section B (40 marks)

31. Evaluate the following expressions.

(a) $-2^2+(-3)^2-(-4^2)$

(b) $2\frac{2}{3}-\frac{2}{3}\times\left(-2\frac{1}{4}\right)\div\left(4\frac{1}{2}\right)$

(5 marks)

32. The cost price of a dress is \$400 and the marked price is \$800. If the dress is sold at a 40% discount, find

(a) the selling price,

(b) the percentage profit.

(4 marks)

33. (a) Round off 745.3482 to 2 significant figures.

(b) Round up 745.3482 to 1 decimal place.

(c) Round down 745.3482 to the nearest hundredth.

(3 marks)

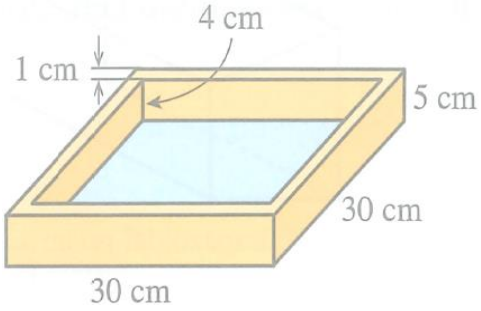
34. Solve the following equations.

(a) $3(w+6)=3-(3w-3)$

(b) $\frac{k-1}{2}-\frac{k+5}{4}=-1$

(7 marks)

35. The figure shows a wooden tray without cover. The thickness of each side of the tray is 1 cm.



(a) Find the capacity of the tray.

(b) Find the volume of wood used to make the tray.

(4 marks)

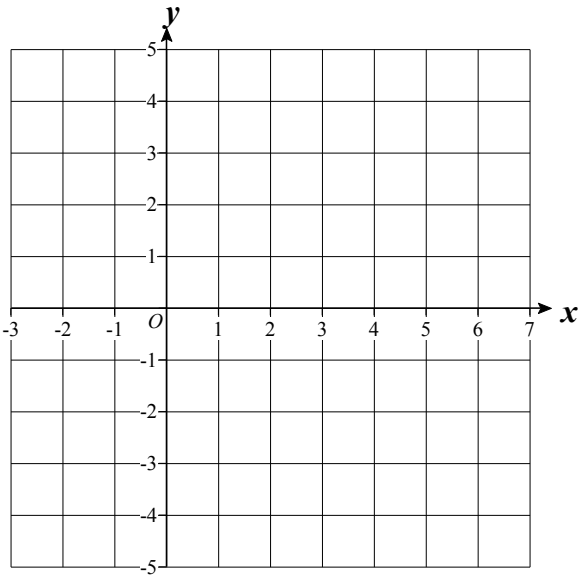
36. Given that *ABCD* is a parallelogram with vertices at *A*(–2, –3), *B*(4, –5) and *D*(–2, 5).

(a) Is there any horizontal line or vertical line in the parallelogram? If yes, name the line.

(b) Find the coordinates of *C*.

(c) Find the area of the parallelogram *ABCD*.

(6 marks)



37. Simplify the following expressions.

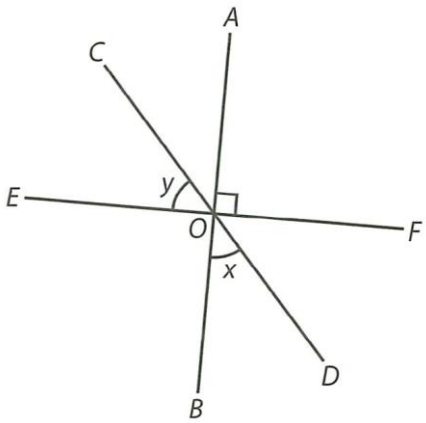
(a) $(3x^2 - 7) + (5x + 2) - (4x - x^2)$

(b) $(3a - 5)(3a + 5)$

(c) $\frac{6m^2n^7}{28m^6n} \times 7m^3n^2$

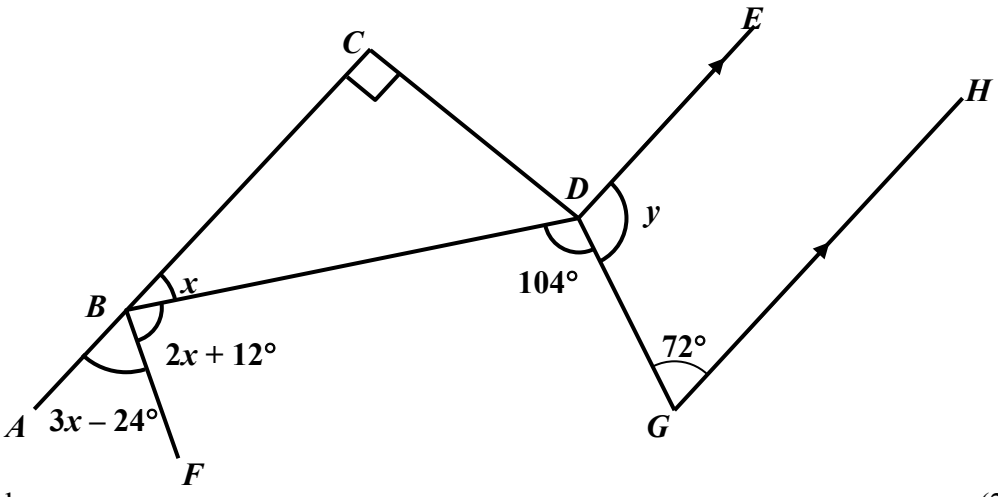
(7 marks)

38. In the figure, reflex $\angle COF = 230°$. AOB, COD and EOF are straight lines. Find the values of x and y. (4 marks)



Section C (30 marks)

39. In the figure, ABC is a straight line, $BC \perp CD$, $DE \parallel GH$.



(a) Find y. (2 marks)

(b) Find x and $\angle BDC$. (5 marks)

(c) Show that $AC \parallel DE$. (3 marks)

40. A group of students sit for two mathematics tests. Between the two tests, there is a tutorial class. The marks in Test 1 are shown below.

65	85	43	61	71	50	31	44	51	32
61	72	45	52	31	76	45	64	37	58

(a) Complete the back-to-back stem-and-leaf diagram below. (2 marks)

Test 1 Leaf (unit)	Stem (tens)	Test 2 Leaf (unit)
	3	5 6
	4	4 4
	5	***a*** 0 1 2 9
	6	0 4 5 5
	7	5 7 8 ***b***
	8	2 6
	9	3

(b) Write down the value of ***a***. Find the possible value(s) of ***b***. (3 marks)

(c) Tom scores the second best mark in Test 2. Write down Tom's mark in Test 2. (1 mark)

(d) If the passing mark is 50, find the passing percentage in Test 1. (2 marks)

(e) Does the tutorial class help the students to improve their performance? Explain your answer. (2 marks)

41. Point $P(-2, 3)$ is shown on the rectangular coordinate plane below.

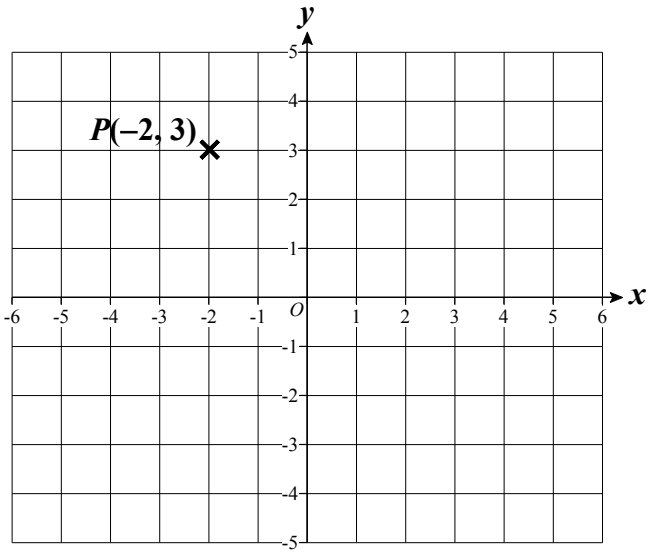
(a) (i) P is reflected along x-axis to S. Write down the coordinates of S.

(ii) P is rotated clockwise about O through 90° to Q. Then Q is translated 1 unit to the right and 5 units downward to R. Write down the coordinates of Q and R.

(iii) Besides rotation, describe the transformation from P to Q by translation.

(iv) Plot Q, R and S on the graph below and join $PQRS$.

(5 marks)



(b) (i) Let X be a point on SR such that $QX \perp SR$. Write down the coordinates of X.

(ii) Find the area of quadrilateral $PQRS$.

(5 marks)

END OF PAPER