CSWCSS F3 2024-25 Final paper two

Final Examination (2024-2025)

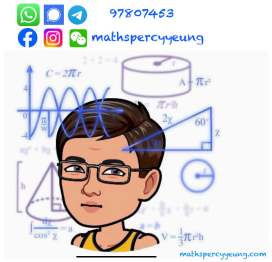
Form 3 **Mathematics**

Total score : **30** **Paper 2**

Date : **5th June, 2025** **11:15 am – 12:00 pm (45 mins)**

Name : _____

Class : _____ **Class No.:** _____



Instructions :

1. Read carefully the instructions on the Answer Sheet and 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.
5. The diagrams in this paper are not necessarily drawn to scale.
6. You are advised to use an HB pencil to mark all the answers on the **Answer Sheet.**
7. You should mark only ONE answer for each question. If you mark more than one answer, you will receive NO MARKS for that question.
8. No marks will be deducted for wrong answers.

Section B Multiple Choice

Answer ALL the questions.

1. $(4\cdot 2^{n+2})^3 =$

   A. 2^{3n+12}

   B. 2^{3n+10}

   C. 2^{3n+8}

   D. 2^{3n+7}

2. Mr. Wong bought a watch for \$2 400 one year ago. Suppose the watch depreciated at 5% every six months. Find the present value of the watch now.

   A. \$2 160

   B. \$2 166

   C. \$2 280

   D. \$2 281.5

3. $2ac+14a-bc-7b =$

   A $(c+7)(2a+b)$.

   B. $(c-7)(2a+b)$.

   C. $(c+7)(2a-b)$.

   D. $(c-7)(2a-b)$.

4. Let θ be an acute angle. If $\sin(\theta-5°)=\cos 75°$, find θ.

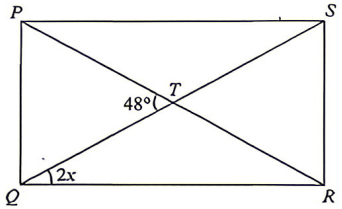
   A. 10°

   B. 20°

   C. 30°

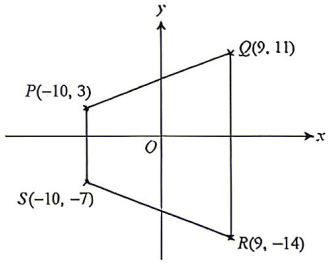
   D. 80°

5. In the figure, $PQRS$ is a rectangle. PR and QS intersect at T. It is given that $\angle PTQ = 48°$ and $\angle TQR = 2x$. Find x.



A. 12°
B. 24°
C. 48°
D. 66°

6. The vertices of trapezium $PQRS$ are $P(-10, 3)$, $Q(9, 11)$, $R(9, -14)$ are $S(-10, -7)$. Find the perimeter of trapezium $PQRS$.



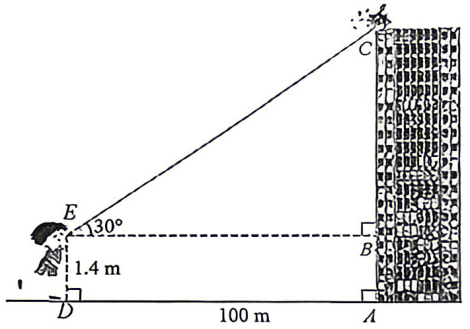
A. 73 units
B. 75.9 units (correct to 3 significant figures)
C. 79.2 units (correct to 3 significant figures)
D. 86.9 units (correct to 3 significant figures)

7. If $a < b < 0$, which of the following must be true?

I. $a - b < 0$
II. $a + b < 0$
III. $a^2 < ab$

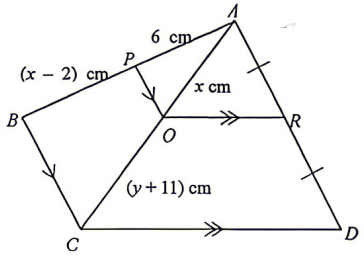
A. I only
B. I and II only
C. II and III only
D. I, II and III

8. As shown in the figure, John is 100 m away from a vertical building AC. There is a [illegible] the top of AC. John's eye level is 1.4 m above the horizontal ground and the angle of elevation of C from John is 30°, Find the height of the building correct to 3 significant figures.



A. 26.4 m
B. 57.7 m
C. 59.1 m
D. 88.0 m

9. In the figure, APB, AQC and ARD are straight lines. Find x and y.



A. $x = 6, y = -5$
B. $x = 6, y = 5$
C. $x = 8, y = 3$
D. $x = 8, y = -3$

10. If the mean of six numbers $2x+1$, $3x-5$, $x+12$, 13, 21 and 18 is 16, then the mode(s) of these numbers is/are

A. 13.
B. 16.
C. 18.
D. 13 and 18.

11. If the median of the set of data $(x, 8, 11, 15, 18, 23)$ is 16, find x.

A. 14
B. 15
C. 16
D. 17

12. 3■ is a 2-dight number, where ■ is an integer chosen at random from 0 to 9 inclusive. Find the probability that the 2-dight number is divisible by 3.

A. $\frac{3}{10}$
B. $\frac{1}{3}$
C. $\frac{4}{9}$
D. $\frac{2}{5}$

13. Express $3.2 \times 10^{-5} - 2.7 \times 10^{-5}$ in scientific notation.

A. 0.5×10^{-5}
B. 5×10^{-4}
C. 5×10^{-6}
D. 0.5×10^{-6}

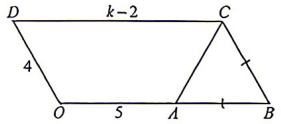
14. Ms. Chu deposits \$88 800 in a bank at an interest rate of 1.2% p.a. for 2 years, compounded monthly. Find the interest obtained correct to the nearest dollar.

A. \$2 112
B. \$2 144
C. \$2 156
D. \$90 956

15. $94x-42-40x^2 =$

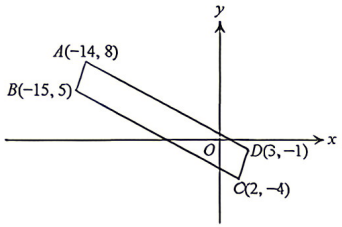
A. $-2(4x-7)(5x-3)$
B. $-2(4x+7)(5x+3)$
C. $-2(2x-7)(10x-3)$
D. $-2(2x+7)(10x+3)$

16. In the figure, $OBCD$ is a parallelogram. A is a point on OB such that $AB = BC$. It is given that $OA = 5$, $OD = 4$ and $DC = k-2$. Find the value of k.



A. 5
B. 7
C. 9
D. 11

17. In the figure, $ABCD$ is a quadrilateral.



Which of the following is true?

I. $AB \parallel DC$

II. $BC \parallel AD$

III. $AC \perp BD$

A. I and II only

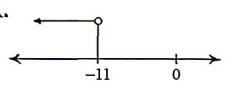
B. I and III only

C. II and III only

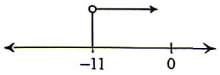
D. I, II and III

18. Which of the following is the graphical representation of the solutions of the inequality $7x + 9 < 5x - 13$?

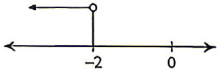
A.



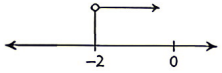
B.



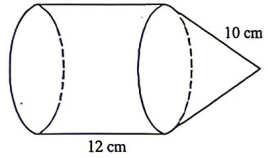
C.



D.



19. The figure shows a solid formed by a right circular cylinder and a right circular cone with a common base. The height of the circular cylinder is 12 cm and the slant height of the circular cone is 10 cm. If the curved surface area of the circular cylinder is 144π cm^2, find the volume of the solid correct to 3 significant figures.



A. 754 cm^3

B. 1 510 cm^3

C. 1 660 cm^3

D. 2 260 cm^3

20. The net chargeable income of Ben is $245 000. If the salaries tax is charged at progressive rates as follows, find his salaries tax payable.

Net chargeable income	Tax rates
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%

A. $23 420.5

B. $23 650

C. $36 750

D. $41 650

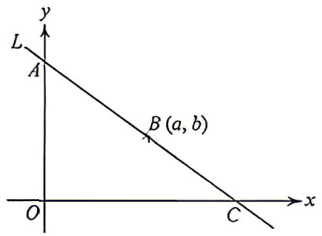
21. In the figure, the straight line L passing through point $B(a, b)$ cuts the y-axis and the x-axis at A and C respectively. If B is the mid-point of AC, what is the slope of L

A. $\frac{a}{b}$

B. $\frac{b}{a}$

C. $-\frac{a}{b}$

D. $-\frac{b}{a}$



22. Two points $A(-7, 5)$ and $B(13, 15)$ are given. If P is a point on AB such that $AP : PB = 2 : 3$, then the coordinates of P are

A. $\left(-\frac{9}{7}, \frac{55}{7}\right)$.

B. $\left(\frac{2}{5}, 11\right)$.

C. $(1, 9)$.

D. $\left(\frac{51}{7}, \frac{85}{7}\right)$.

23. When a number is first increased by 25% and then decreased by r%, the number is decreased by 75%. What is the value of r?

A. 80

B. 75

C. 25

D. 20

24. $10110000001101_2 =$

A. $11\times2^{10}+26$

B. $11\times2^{10}+13$

C. $11\times2^{11}+26$

D. $11\times2^{11}+13$

25. There are some apples and oranges in a box, where the number of apples is more than that of oranges by 12. If the probability for a fruit randomly selected from the box to be an apple is $\frac{3}{4}$, find the number of oranges in the box.

A. 6

B. 12

C. 18

D. 24

26. The table shows the distribution of the ratings for a coffee maker given by a group of users.

Rating	1	2	3	4	5
Frequency	2	0	12	28	18

If a user is randomly selected from the group, find the expected value of the rating for the coffee maker given by the user.

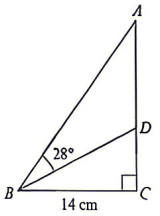
A. 1

B. 3

C. 4

D. 5

27. In the figure, D is a point on AC such that BD is an angle bisector of $\triangle ABC$. Find AD correct to 3 significant figures.



A. 7.44 cm

B. 13.3 cm

C. 14.9 cm

D. 20.8 cm

28. A solid metal right circular cone of height 16 cm and base radius 4 cm is melted and recast into a solid sphere. Find the radius of the sphere.

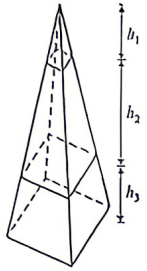
A. 2.31 cm (cor. to 3 sig. fig.)

B. 2.77 cm (cor. to 3 sig. fig.)

C. 4 cm

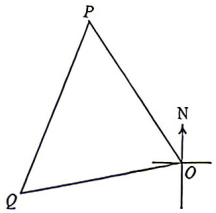
D. 8 cm

29. In the figure, a pyramid is cut into three solids by two planes parallel to its base. The heights of the three solids are h_1, h_2 and h_3, where $h_1 : h_2 : h_3 = 1:2:1$. Find the ratio of the volumes of the three solids.



A. 1:3:4
B. 1:9:16
C. 1:26:37
D. 1:27:64

30. In the figure, the bearings of P and Q from O are N34°W and S68°W respectively. If $OP = OQ$, then the bearing of P from Q is



A. S73°W.
B. S17°W.
C. N73°E.
D. N17°E.

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