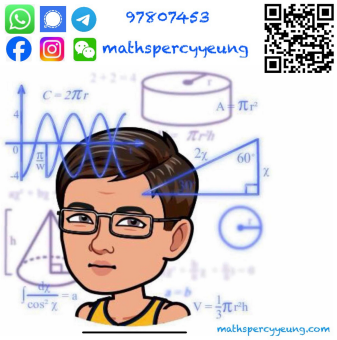
2023-2024 S3
2nd TERM UT 2
MATH

MC



2023– 2024
S3 Second Term Uniform Test 2

MATHEMATICS

31st May, 2024
Time Allowed: 30 minutes
Total Marks: 20

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.

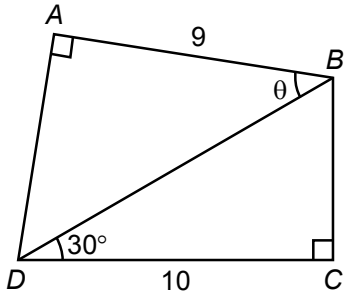
8. Calculators with 'H.K.E.A.A. Approved' can be used.

Choose the best answer for each question.

1. If $\begin{cases} 5x+6y=27 \\ 6x-y=16 \end{cases}$, then $y=$

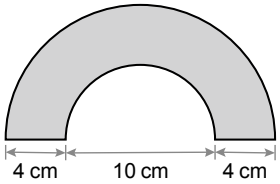
   A. -3.
   B. -2.
   C. 2.
   D. 3.

2. Find θ in the figure correct to the nearest degree.



   A. 39°
   B. 41°
   C. 47°
   D. 63°

3. The following figure is formed by semi-circles and straight lines. Find the area of the shaded region.

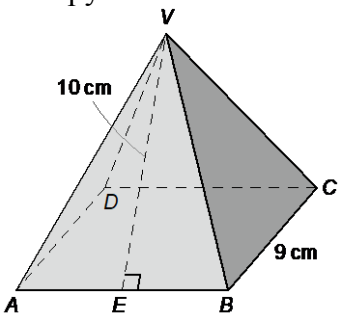


   A. 28π cm^2
   B. 56π cm^2
   C. 112π cm^2
   D. 224π cm^2

4. If the mean of a, b and c is 15, and the mean of a, b, c, d and e is 18, find the value of $d+e$.

   A. 18
   B. 22.5
   C. 30
   D. 45

5. The figure shows a right pyramid $VABCD$ with a square base. Find the total surface area of the pyramid.

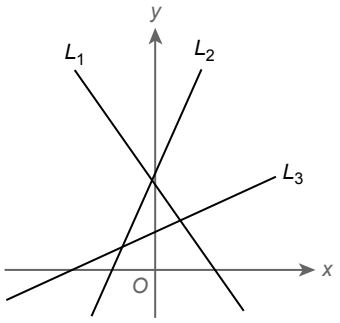


   A. 261 cm^2
   B. 270 cm^2
   C. 280 cm^2
   D. 441 cm^2

6. $\dfrac{\tan\theta}{\cos(90°-\theta)}-\dfrac{1}{\sin(90°-\theta)}=$

   A. $\dfrac{1}{\cos\theta}$.
   B. $\dfrac{1}{\sin\theta\cos^2\theta}$.
   C. $\dfrac{\sin\theta-\cos\theta}{\sin\theta\cos\theta}$.
   D. 0.

7. In the figure, the slopes of straight lines L_1, L_2 and L_3 are m_1, m_2 and m_3 respectively.



   Which of the following must be true?
   A. $m_1 < m_2 < m_3$
   B. $m_1 < m_3 < m_2$
   C. $m_2 < m_3 < m_1$
   D. $m_3 < m_2 < m_1$

8. The figure shows a test tube formed by a right cylindrical part and a hemispherical part. Find the capacity of the test tube.

A. $\frac{32\pi}{3}$ cm^3

B. $\frac{35\pi}{3}$ cm^3

C. $\frac{37\pi}{3}$ cm^3

D. $\frac{41\pi}{3}$ cm^3

9. If $\frac{\cos(\theta-10°)}{\sin(2\theta+40°)}=1$, then $\theta=$

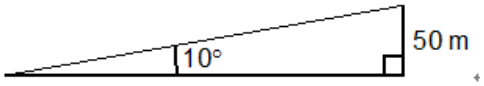
A. 10°.

B. 20°.

C. 50°.

D. 60°.

10. Kelly runs up a slope with the inclination of 10° and rises 50 m vertically. Find her actual distance moved correct to 3 significant figures.



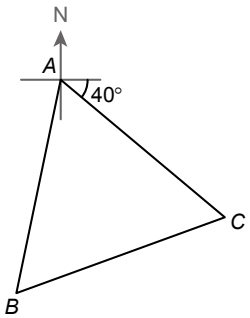
A. 8.68 m

B. 8.82 m

C. 284 m

D. 288 m

11. In the figure, ΔABC is an equilateral triangle. Find the compass bearing of A from B.



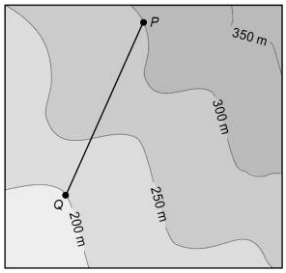
A. S10°E

B. S70°E

C. N10°E

D. N70°E

12. The figure shows a map with the scale of $1:20000$. From the map, we have $PQ=4$ cm. Find the inclination of PQ correct to 3 significant figures.



Scale 1:20000

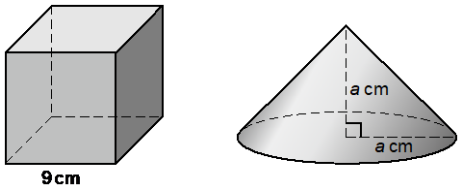
A. 7.13°

B. 14.0°

C. 26.6°

D. 82.9°

13. In the figure, the volumes of the cube and the right circular cone are the same. Find the value of a correct to 1 decimal place.



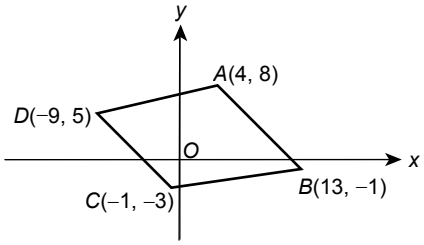
A. 3.0

B. 4.3

C. 8.9

D. 26.7

14. In the figure, the vertices of quadrilateral $ABCD$ are $A(4, 8)$, $B(13, -1)$, $C(-1, -3)$ and $D(-9, 5)$.



Which of the following must be true?

I. $AB \,//\, DC$

II. $AD < BC$

III. $ABCD$ is a parallelogram.

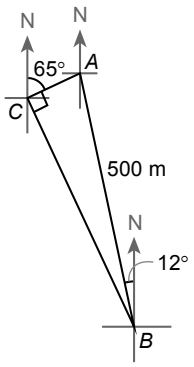
A. I only

B. I and II only

C. I and III only

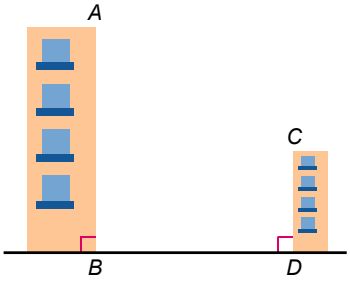
D. II and III only

15. In the figure, the compass bearings of point A from point B and point C are N12°W and N65°E respectively, and $AB = 500$ m. Find BC correct to 3 significant figures.



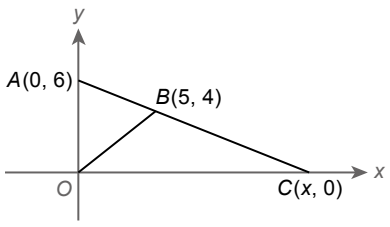
A. 112 m
B. 453 m
C. 487 m
D. 513 m

16. In the figure, if $CD = 12$ m, $BD = 20$ m, and the angle of depression of C from A is 32°, find the difference of height of two buildings correct to 3 significant figures.



A. 9.7 m
B. 10.6 m
C. 12.5 m
D. 17.0 m

17. In the figure, three points $A(0, 6)$, $B(5, 4)$ and $C(x, 0)$ are collinear. Find the ratio of the area of ΔOAB to that of ΔOBC.



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

18. If the total surface area of a cube decreases by 19%, find the percentage decrease in its length.

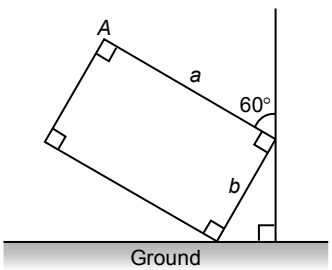
A. 9%
B. 10%
C. 19%
D. 81%

19. $\{x-2,\ x-2,\ x,\ x+4\}$ and $\{x-1,\ x,\ x,\ x+1\}$ are two groups of numbers. Which of the following is/are true?

I. The two groups of numbers have the same mean.
II. The two groups of numbers have the same median.
III. The two groups of numbers have the same mode.

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

20. In the figure, find the height of point A above the ground.



A. $\frac{1}{2}a+\frac{1}{2}b$
B. $\frac{\sqrt{3}}{2}a+\frac{1}{2}b$
C. $\frac{\sqrt{2}}{2}a+\frac{\sqrt{2}}{2}b$
D. $\frac{1}{2}a+\frac{\sqrt{3}}{2}b$

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