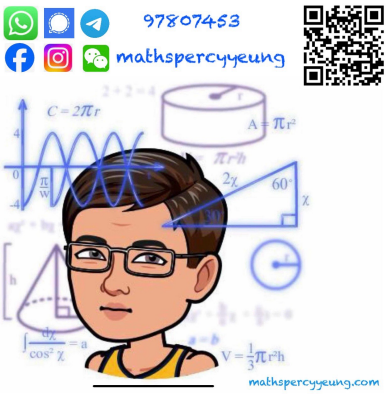
2021-2022 S3
2nd TERM UT 2
MATH

MC




2021– 2022
S3 Second Term Uniform Test 2

# MATHEMATICS

8th June, 2022
Time Allowed: 25 minutes
Total Marks: 19

**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. $C(3, -2)$ is rotated about the origin through 180° to $C'$. Find the coordinates of $C'$.

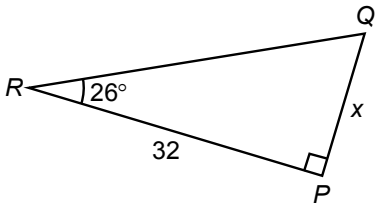
   A. $(-3, 2)$

   B. $(-3, -2)$

   C. $(3, 2)$

   D. $(2, -3)$

2. In the figure, $\angle RPQ = 90°$ , $PR = 32$ and $\angle QRP = 26°$. Find $x$ correct to 3 significant figures.




   A. 13.8

   B. 14.0

   C. 15.6

   D. 16.2

3. Solve the inequality $x \le \dfrac{9x-4}{5}$.

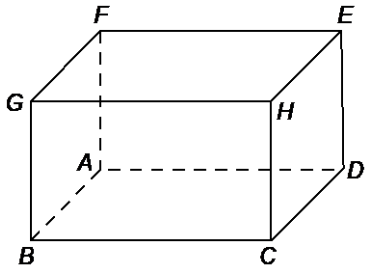
   A. $x \ge 1$

   B. $x \le 1$

   C. $x \le -1$

   D. $x \ge -1$

4. The figure shows cuboid *ABCDEFGH*.




   Which of the following is the angle between planes *GFDC* and *EDCH*?

   A. $\angle FDC$

   B. $\angle FDE$

   C. $\angle GCD$

   D. $\angle GCB$

5. If the base radius and the volume of a right circular cone are 6 cm and $96\pi\,\text{cm}^3$ respectively, find the slant height of the circular cone.

   A. 6 cm

   B. 8 cm

   C. 10 cm

   D. 12 cm

6. Two points $L(-9, 6)$ and $M(-2, -1)$ are given. If $N$ is a point lying on the $y$-axis such that $LN = MN$ , find the coordinates of $N$.

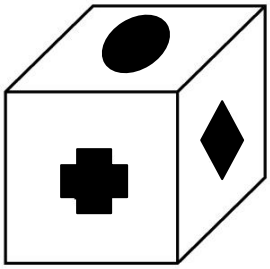
   A. $(0, 8)$

   B. $(0, -8)$

   C. $(0, 11)$

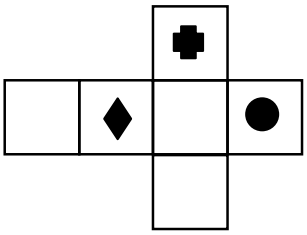
   D. $(0, -11)$

7. The figure shows a cube.

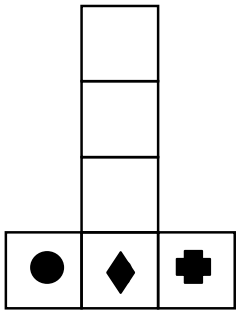


Which of the following nets can be folded into the given cube?

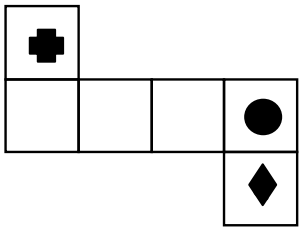
A.



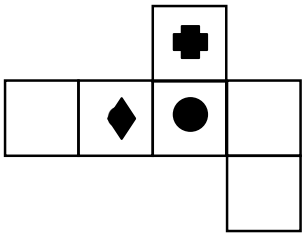
B.



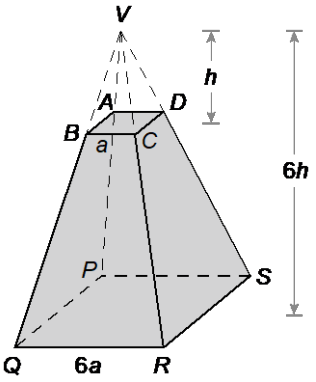
C.



D.



8. In the figure, the upper base and the lower base of the right frustum are squares of sides $a$ and $6a$ each respectively. If the heights of pyramids $VPQRS$ and $VABCD$ are $6h$ and $h$ respectively, find $\frac{\text{Volume of the frustum}}{\text{Volume of pyramid } VPQRS}$.



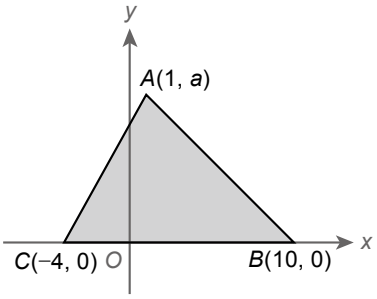

A. $\frac{1}{64}$

B. $\frac{7}{8}$

C. $\frac{63}{64}$

D. $\frac{215}{216}$

9. In the figure, the area of $\Delta ABC$ is 63 sq. units. Find the length of $AC$. (Give your answer correct to 3 significant figures.)




A. 6.73 units

B. 10.3 units

C. 12.7 units

D. 21.6 units

10. If the height and the base diameter of a right circular cone are 12 cm and 18 cm respectively, find the curved surface area of the circular cone.

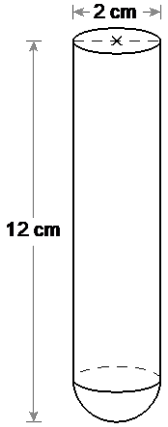
A. $135\pi$ cm$^2$

B. $180\pi$ cm$^2$

C. $270\pi$ cm$^2$

D. $300\pi$ cm$^2$

11. 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. $\frac{38\pi}{3}$ cm$^3$

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

12. If $M(a,\ a+1)$ is the mid-point of $A(-21,\ 4)$ and $B(9,\ b)$ then $b=$

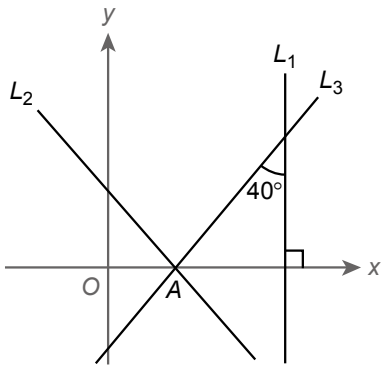
A. $-6$.

B. $-14$.

C. $-16$.

D. $-32$.

13. In the figure, the angle between straight lines $L_1$ and $L_3$ is 40°. $L_3$ and straight line $L_2$ intersect at $A$, where $A$ lies on the $x$-axis.




If the slopes of $L_1$, $L_2$ and $L_3$ are $m_1$, $m_2$ and $m_3$ respectively, which of the following must be true?

I. $m_1 = 0$

II. $m_2 < 0$

III. $m_3 > 1$

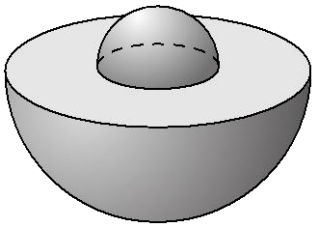
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

14. The figure shows a sculpture formed by two hemispheres. The radius of the upper hemisphere is 0.6 m, while the radius of the lower hemisphere is 1.2 m. Find the total surface area of the sculpture.



A. $1.296\pi$ m$^2$

B. $3.6\pi$ m$^2$

C. $4.68\pi$ m$^2$

D. $7.2\pi$ m$^2$

15. It is given that the slope of $L$ is $\frac{1}{3}$ and $AB \perp L$, where the coordinates of $A$ and $B$ are (1, 0) and (0, $n$) respectively. Find the value of $n$.

A. –3

B. $-\frac{1}{3}$

C. $\frac{1}{3}$

D. 3

16. If $\theta$ is an acute angle and $\cos(\theta - 12°) = \sin 44°$, then $\theta =$

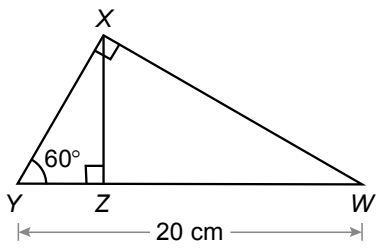
A. 44°.

B. 48°.

C. 58°.

D. 68°.

17. In the figure, $\angle YXW = 90°$, $XZ \perp YW$ and $WZY$ is a straight line. Find the length of $XZ$.




A. $10\sqrt{3}$ cm

B. $5\sqrt{3}$ cm

C. $\frac{10\sqrt{3}}{3}$ cm

D. 5 cm

18. $\frac{1}{\tan^2(90° - \theta)} + \frac{\sin^2 \theta}{\sin^2(90° - \theta)} =$

A. 0.

B. 1.

C. $2\cos^2 \theta$.

D. $2\tan^2 \theta$.

19. $(\cos \theta + \sin \theta)^2 - 1 =$

A. $\cos \theta + \sin \theta$.

B. $2\cos \theta + 2\sin \theta$.

C. $\cos \theta \sin \theta$.

D. $2\cos \theta \sin \theta$.

**END OF PAPER**