17-18 F.3
2nd TERM UT1
MATH

2017 – 2018
Form 3 Second Term Uniform Test 1

MATHEMATICS

Question–Answer Book

23rd April, 2018
8:15 am – 9:15 am (1 hour)

This paper must be answered in English

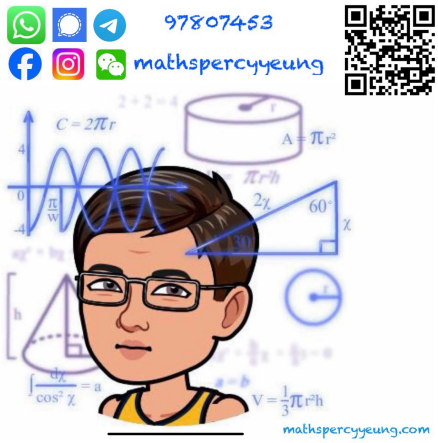
INSTRUCTIONS

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

2. Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question – Answer Book.

3. Unless otherwise specified, all working must be clearly shown and numerical answers should be either exact or correct to 3 significant figures.

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

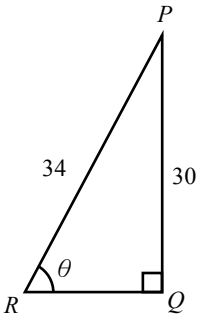


Section	Marks
A (1 - 2)	/8
A (3 - 11)	/42
A Total	**/50**
B Total	**/20**
TOTAL	**/70**

Section A: (50 marks)

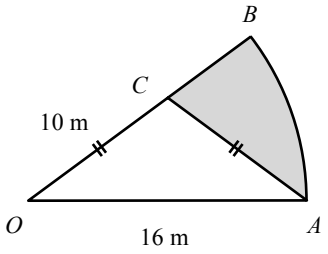
1. In the figure, find the values of sin θ, cos θ and tan θ.

(3 marks)

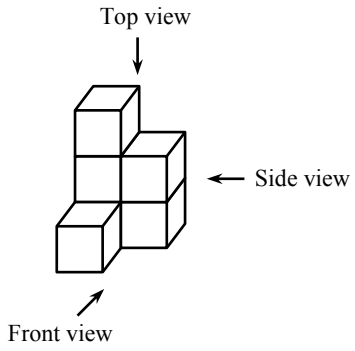


2. In the figure, AOB is a sector with centre O and radius 16 m. C is a point on OB such that $OC = AC$. It is given that $OC = 10$ m.
   (a) Find $\angle AOB$.
   (b) Find the area of the shaded region.

(5 marks)



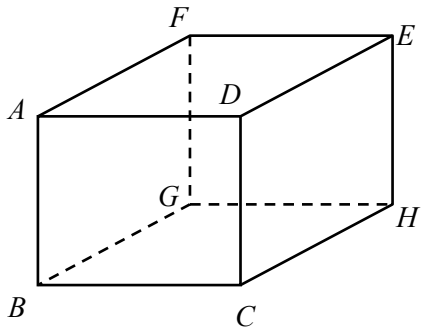
3. The figure shows a solid formed by some identical cubes. Draw the orthographic projections of the solid.



(4 marks)

		Front view				Top view				Side view				

4. In the figure, *ABCDEFGH* is a cuboid.



(a) Name the angle between line *BD* and plane *ADEF*.

(b) Name the angle between line *AH* and plane *CDEH*.

(c) Name the angle between planes *ABGF* and *ADEF*.

(d) Name the angle between planes *ADEF* and *BCEF*.

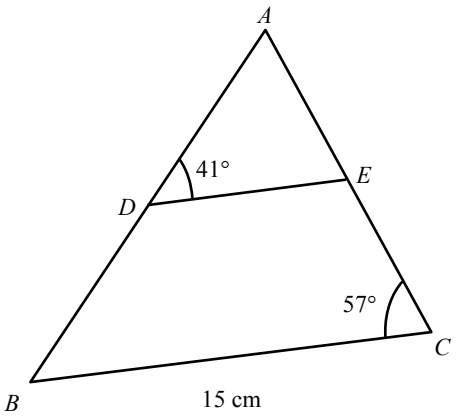
(4 marks)

5. In the figure, D and E are the mid-points of AB and AC respectively. $\angle ADE = 41°$, $\angle ACB = 57°$ and $BC = 15$ cm.

(a) Find DE.

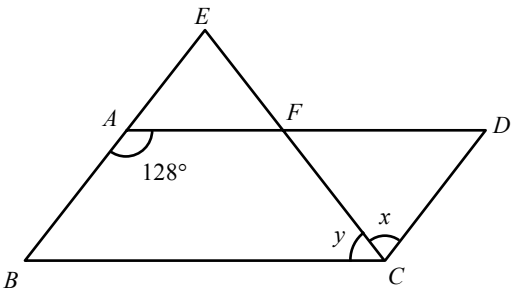
(b) Find $\angle BAC$.

(4 marks)



6. In the figure, EAB is a straight line. $ABCD$ is a parallelogram. EC intersects AD at F. $EB = EC$ and $\angle BAD = 128°$. Find x and y.

(4 marks)

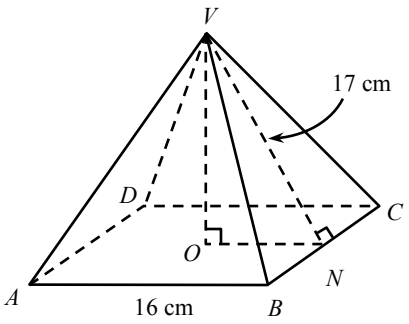


7. The figure shows a right pyramid $VABCD$ with a square base of side 16 cm. $VO \perp ON$, $VN \perp BC$ and $VN = 17$ cm.

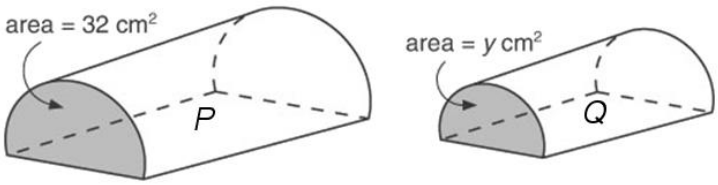
(a) Find the height of the pyramid.

(b) Find the volume of the pyramid.

(5 marks)



8. The figure shows two similar prisms P and Q, both with a hemispherical base. The volumes of prisms P and Q are 128 cm^3 and 54 cm^3 respectively.

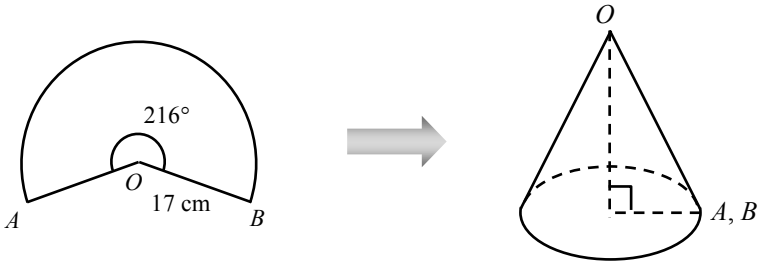


(a) Find the ratio of the base diameter of prism P to that of prism Q.

(b) Find the value of y.

(5 marks)

9. Sandy has a paper sector AOB as shown in the figure. The radius of the sector is 17 cm. Reflex $\angle AOB = 216°$. By joining OA and OB together, the sector is folded to form a right circular cone.



(a) Find the base radius of the cone. (3 marks)

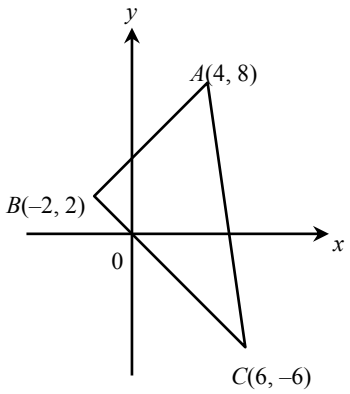
(b) Find the volume of the cone, correct to the nearest integer. (3 marks)

10. In the figure, $A(4, 8)$, $B(-2, 2)$ and $C(6, -6)$ are the vertices of $\triangle ABC$.

(a) Show that $\triangle ABC$ is a right-angled triangle.

(b) Find the area of $\triangle ABC$.

(5 marks)

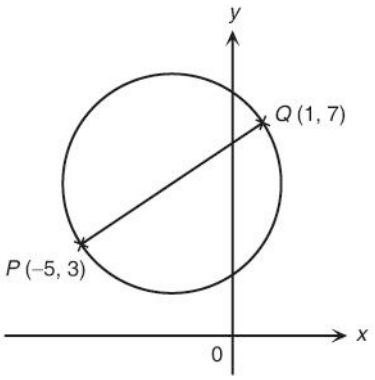


11. In the figure, PQ is a diameter of the circle.

(a) Find the coordinates of the centre of the circle.

(b) It is given that $R(-5, 7)$ and S are the end points of the diameter RS of the circle. Find the coordinates of S.

(5 marks)

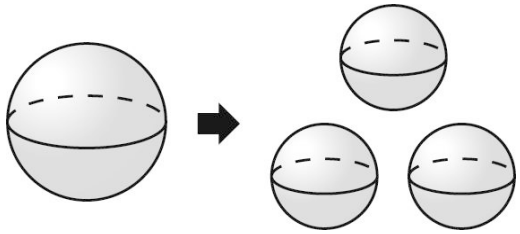


Section B: (20 marks)

12. The surface area of a metal solid sphere is $324\pi\,\text{cm}^2$.

(a) Find the radius of the sphere. (3 marks)

(b) The sphere is then melted and recast into three identical spheres.

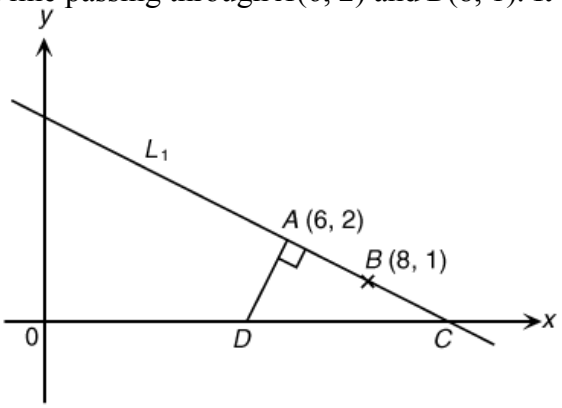


(i) Find the radius of each small sphere.

(ii) Find the increase in the total surface area in terms of π.

(7 marks)

13. In the figure, L_1 is the straight line passing through $A(6, 2)$ and $B(8, 1)$. It cuts the x-axis at C.



(a) Find the slope of L_1. (2 marks)

(b) Find the coordinates of C. (4 marks)

(c) Given that D is a point on the x-axis so that $AD \perp L_1$, find the coordinates of D. (4 marks)

End of Paper