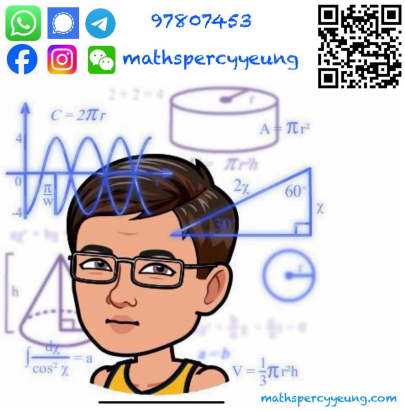
20-21 F.3
2nd TERM UT1
MATH



2020 – 2021
Form 3 Second Term Uniform Test 1

MATHEMATICS

Question–Answer Book

5th May, 2021
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)	/9
A (3 - 11)	/41
A Total	**/50**
B Total	**/20**
TOTAL	**/70**

Section A: (50 marks)

1. Consider the formula $a+1=\frac{3+b}{4}$.

   (a) Make b the subject of the formula.

   (b) If $a = -4$, find the value of b.

(4 marks)

2. (a) Solve the inequality $\frac{13-2y}{3} \geq 16 + y$ and represent the solutions graphically.

   (b) If y is an integer, find the greatest possible value of y.

(5 marks)

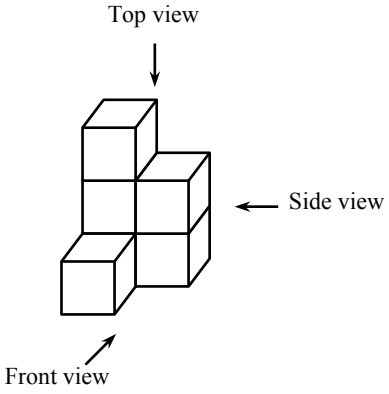
3. Simplify $\frac{(ab)^3}{a^4b^{-5}}$ and express your answer with positive indices. (3 marks)

4. Factorize
   (a) a^2+4a-5,
   (b) $a^2+4a-5+ab+5b$.

(4 marks)

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

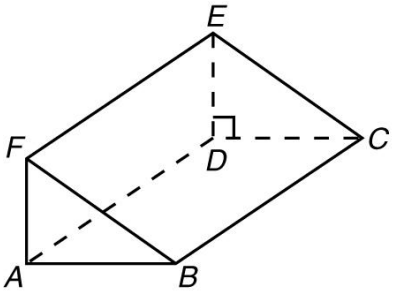
(4 marks)



Front view Top view Side view

6. The figure shows a triangular prism *ABCDEF*.
   (a) Name the projection of *BE* on plane *ABCD*.
   (b) Name the projection of *CF* on plane *CDE*.
   (c) Name the angle between *BE* and plane *ADEF*.
   (d) Name the angle between planes *ABCD* and *BCEF*.

(4 marks)

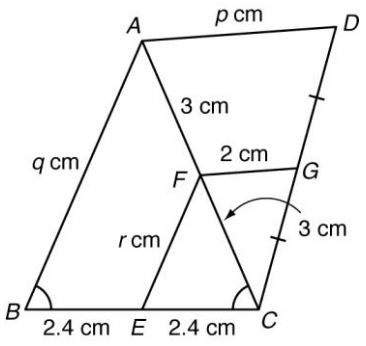


7. In the figure, AFC, BEC and CGD are straight lines. $CG = GD$ and $\angle ABC = \angle ACB$.

(a) Find p.

(b) Find q and r.

(4 marks)

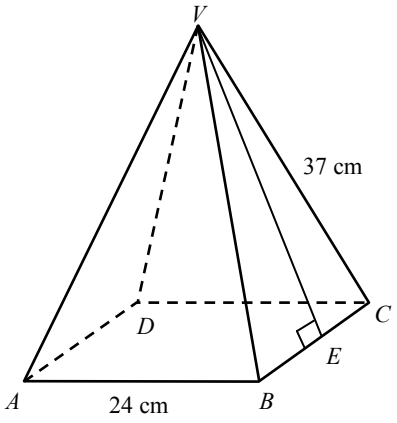


8. In the figure, $VABCD$ is a right pyramid with a square base of side 24 cm. The length of the slant edge is 37 cm and $VE \perp BC$.

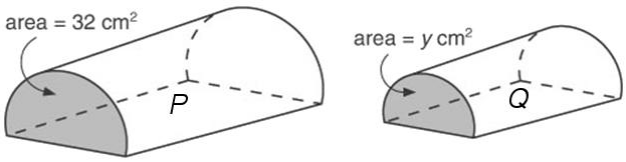
(a) Find the length of VE.

(b) Find the total surface area of the pyramid.

(5 marks)



9. 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.

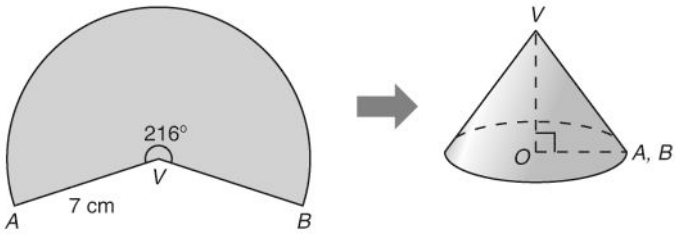


(a) Find the ratio of the base diameter of prism P to that of prism Q.

(b) Find the value of y.

(5 marks)

10. In the figure, a sector is folded to form a right circular cone.



(a) Find the base radius of the cone.

(b) Find the volume of the cone.

(Give your answers correct to 1 decimal place.)

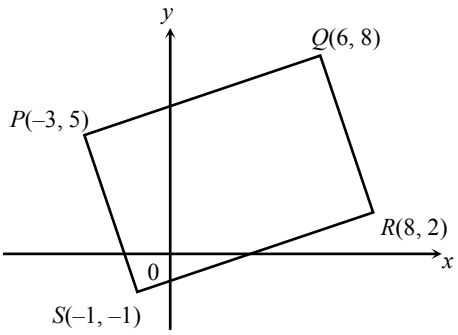
(6 marks)

11. In the figure, $P(-3, 5)$, $Q(6, 8)$, $R(8, 2)$ and $S(-1, -1)$ are the vertices of a rectangle $PQRS$.

(a) Find PQ and QR.

(b) Find the area of $PQRS$.

(6 marks)

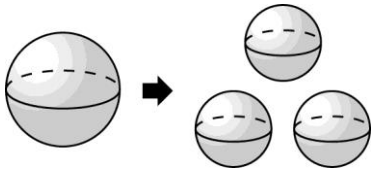


Section B: (20 marks)

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.

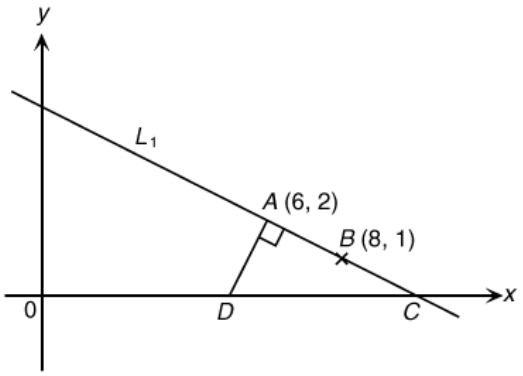


(i) Find the radii of the small spheres.

(ii) Find the increase in the total surface area.

(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