Final Examination 2020-2021

Form 1
174 students

MATHEMATICS
Paper I
Time Allowed: 1 hour 30 minutes

Class: _____ Class No.: _____ Division: _____ Name: _____

Please read the following <u>instructions</u> very carefully.

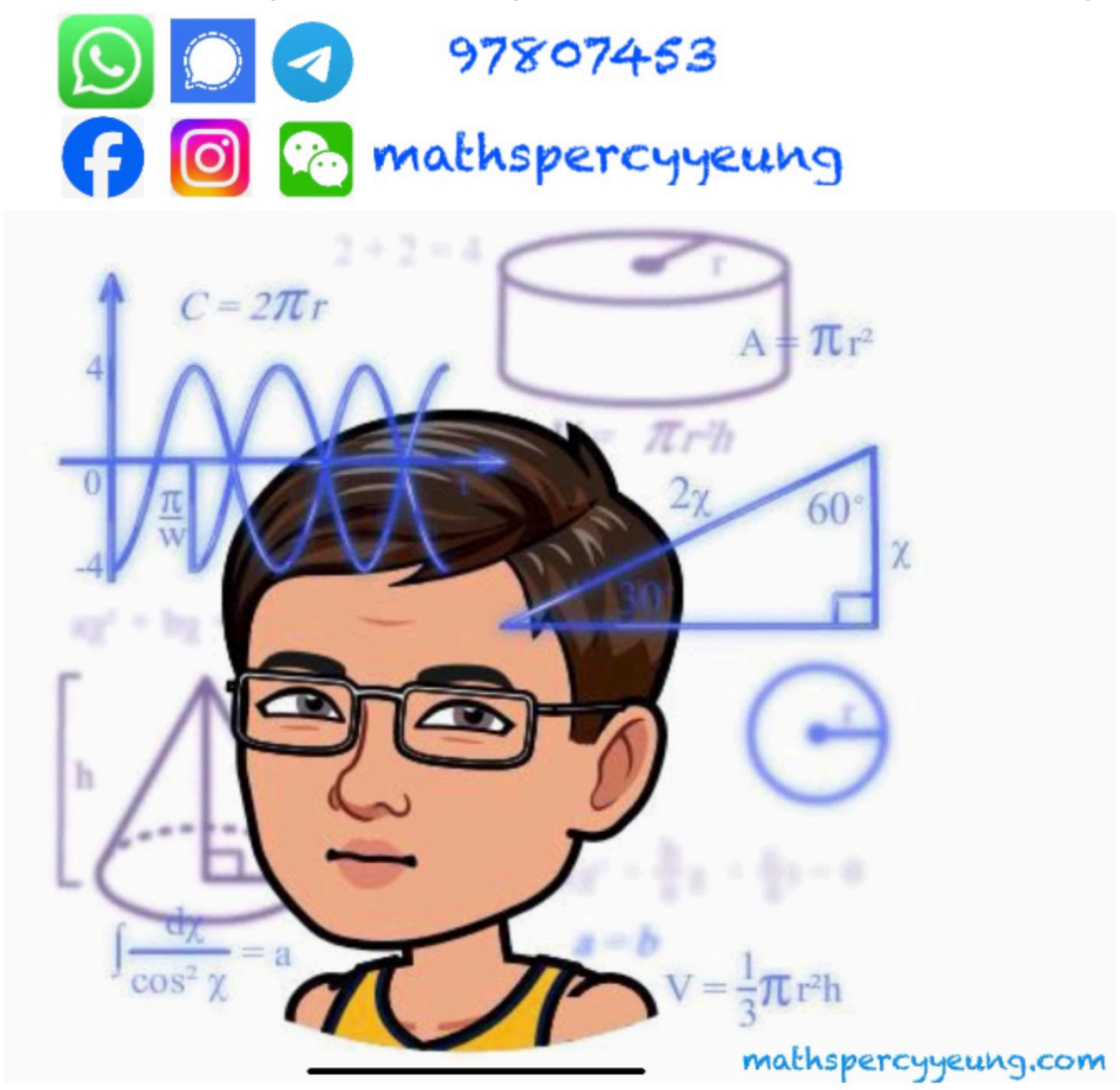
1. Write your class, class number, name and division in the spaces provided on this cover.

2. This paper carries 100 marks. Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question-Answer Paper.

3. ***ALL*** working must be clearly shown.

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

For Markers' Use Only	
Question No.	**Marks**



For Markers' Use Only	
Question No.	**Marks**
8	(8)
9	(9)
10	(10)
11	(7)
12	(7)
13	(8)
14	(7)
Total	(100)

1. The general term a_n of a sequence is $9-5n$.

   (a) Find the value of a_3. (2 marks)

   (b) If $a_3-2a_r=176$,

      (i) find the value of a_r. (2 marks)

      (ii) find the value of r. (2 marks)

2. (a) Simplify $7b-12b\div4+5\times2b-9$. (3 marks)

(b) Solve $\frac{2a-1}{5}=7-\frac{a}{2}$. (3 marks)

3. At a concert, the prices of an adult ticket and a student ticket are \$100 and \$50 respectively. If 530 tickets are sold altogether and the total income is \$42500, find the amount received from the student tickets. (5 marks)

4. (a) Simplify $(3x-2)-(2x^2-x+3)$ and arrange the terms in descending power of x. (2 marks)

   (b) Expand and simplify $(2x-3)[(3x-2)-(2x^2-x+3)]$. (4 marks)

   (c) Write down the coefficient of x and the constant term in the result obtained in (b). (2 marks)

5. Simplify the following and express your answer with positive indices.

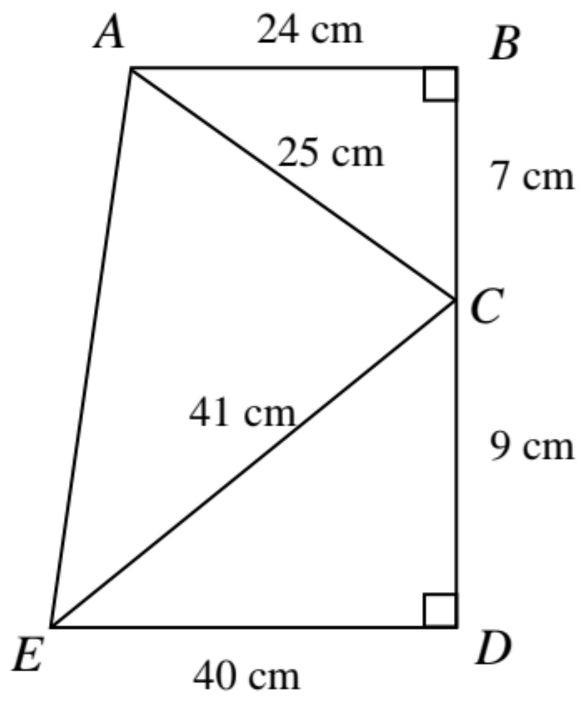
(a) $(-2x^2y)^3(xy^3)^2$ (3 marks)

(b) $\dfrac{10pq}{p^2(-5q^5)^2} \times p^6$ (5 marks)

6. In the figure, BCD is a straight line.

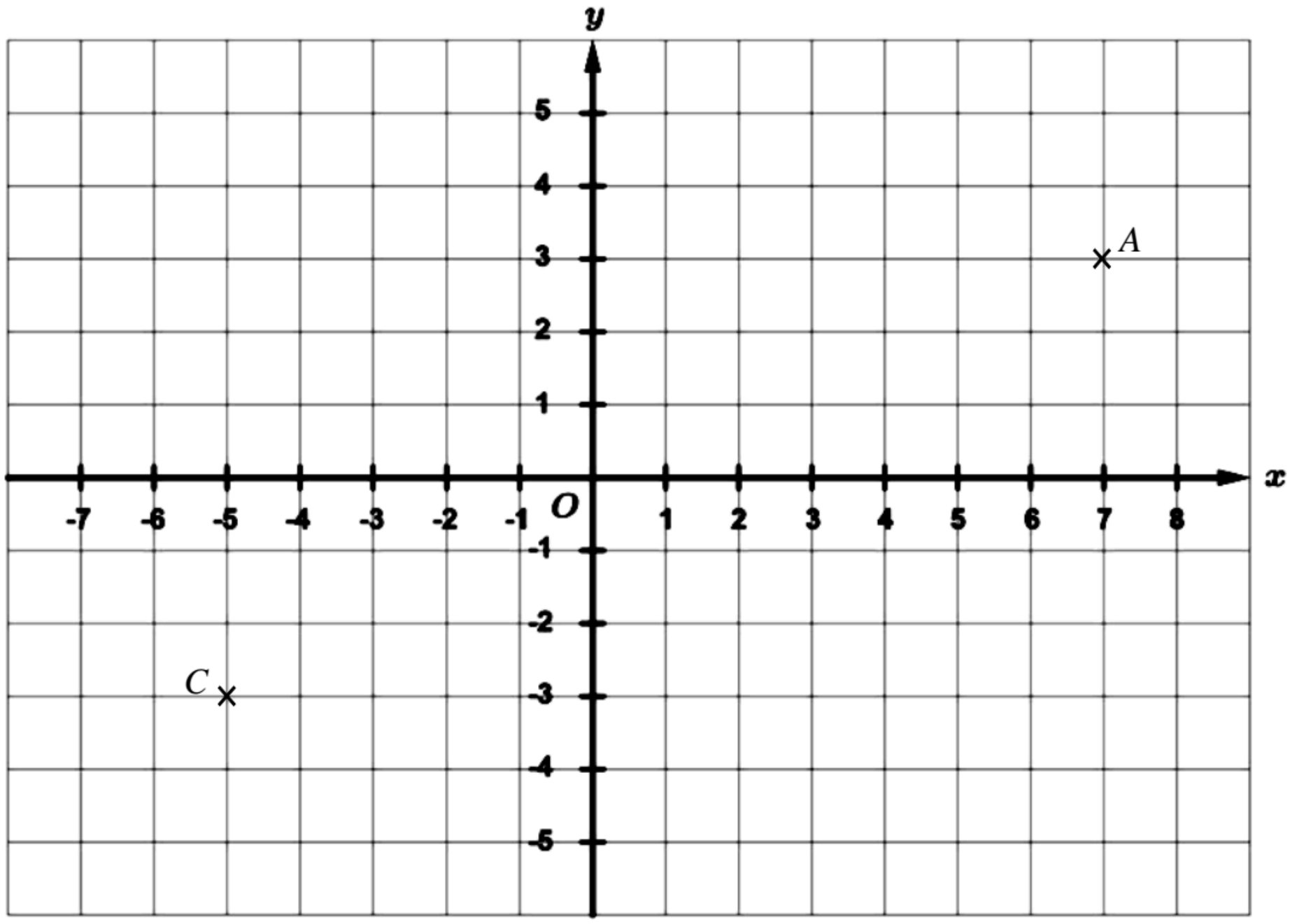
(a) Find the area of ΔACE. (3 marks)

(b) Paul claims that the area of ΔACE is $\frac{1}{2} \times AC \times EC$. Do you agree? Explain your answer. (2 marks)



7. Given that $P(-7, 1)$ and $Q(2, 1)$ are two points on a rectangular coordinate plane.
   (a) Find the length PQ. (2 marks)
   (b) $S(0, m)$ is a point on the y-axis such that the area of ΔPQS is 27 sq. units. Find all the possible values of m. (4 marks)

8. In the figure, A and C are two points on a rectangular coordinate plane.



(a) Given that B and D are two vertices of rectangle $ABCD$ and AB is a horizontal line segment. Write down the coordinates of B and D respectively. (2 marks)

(b) By drawing AC and BD on the diagram, find the coordinates of the point of intersection of AC and BD. (2 marks)

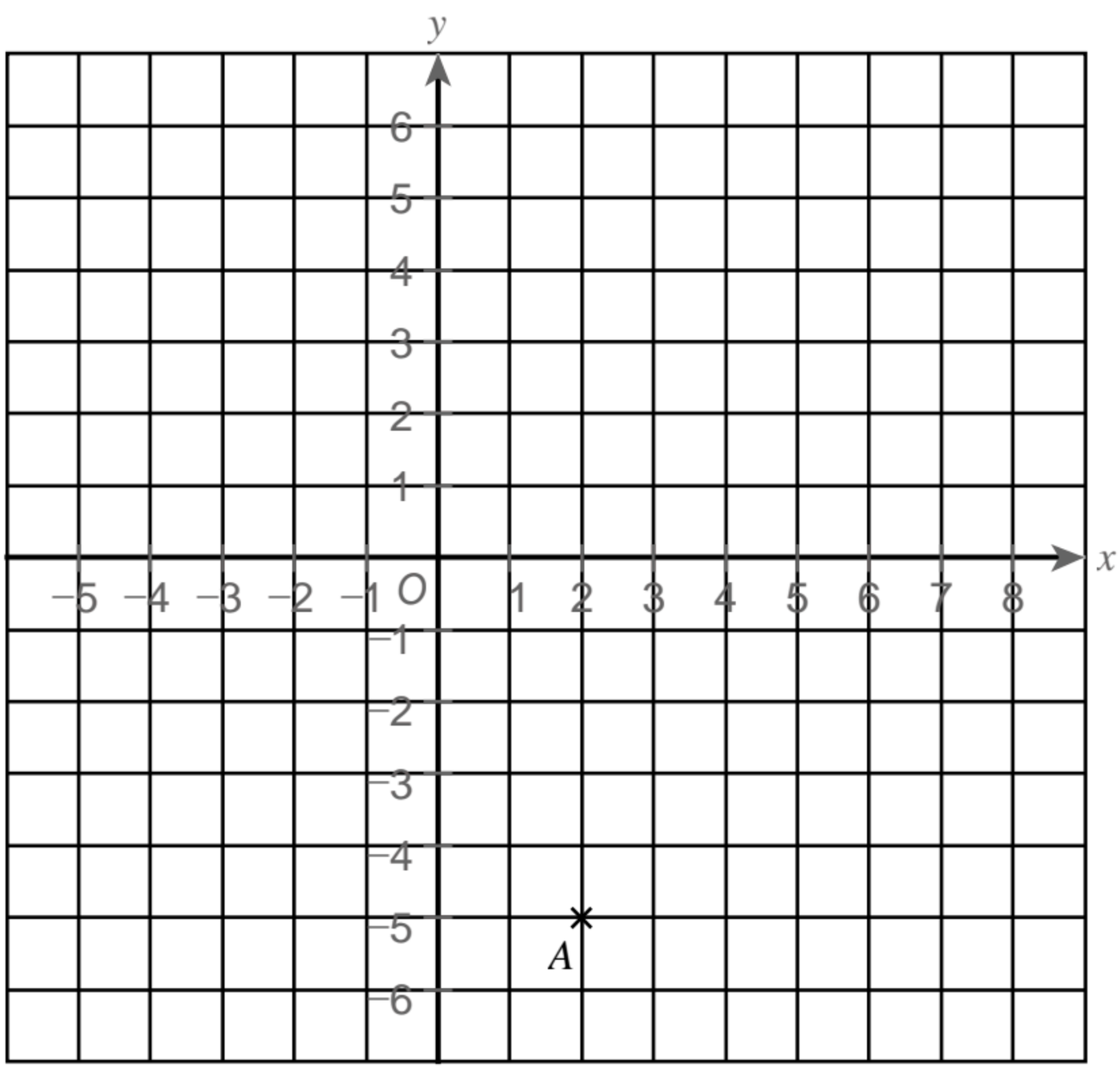
(c) Find the perimeter of the rectangle $ABCD$. (4 marks)

9. (a) A (2, –5) is translated rightwards by 4 units and then reflected with respect to the x-axis to obtain B. Draw B in the coordinate plane below and write down the coordinates of B. (2 marks)

(b) A (2, –5) is rotated anticlockwise about the origin through 270° to C. Draw C in the coordinate plane below and write down the coordinates of C. (2 marks)

(c) If C undergoes a transformation to D(–5, 5), describe the transformation. (2 marks)

(d) Find the area of $ABDC$. (3 marks)



10. The figure shows a right prism.

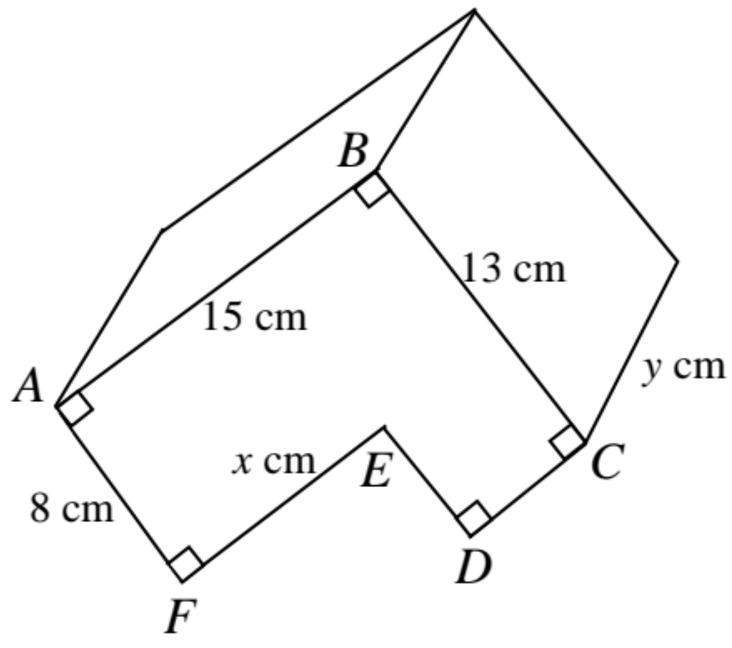
(a) (i) Find the perimeter of polygon *ABCDEF*. (2 marks)

(ii) If the total area of all lateral faces of the prism is 672 cm^2, find the value of y. (2 marks)

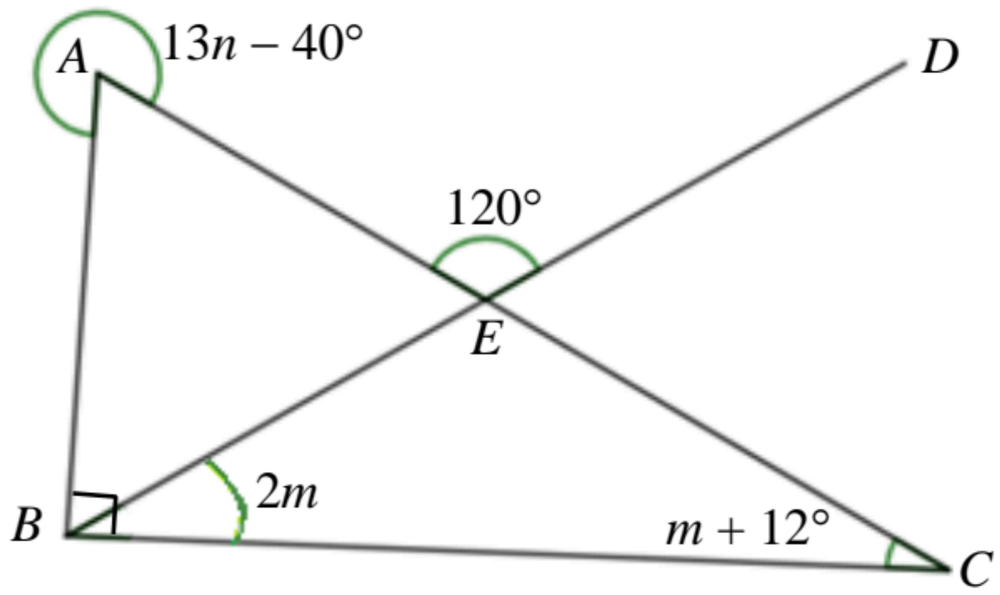
(b) (i) Express the base area of the prism in terms of x. (2 marks)

(ii) If the total surface area of the prism is 972 cm^2, find the value of x. (2 marks)

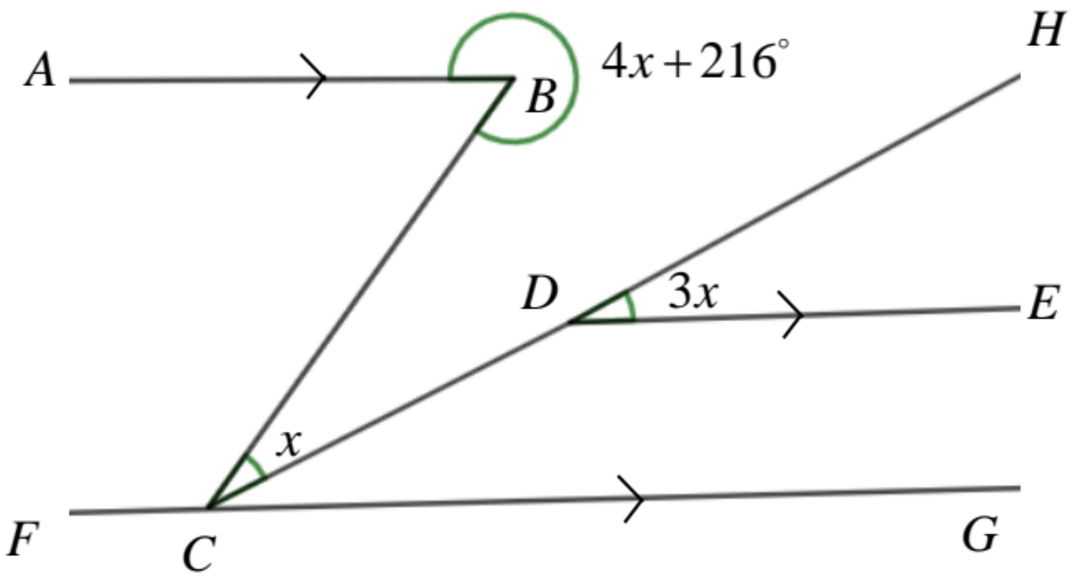
(c) Find the volume of the prism. (2 marks)



11. In the figure, AEC and BED are straight lines. $\angle ABC$ is a right angle. Find m and n. (7 marks)

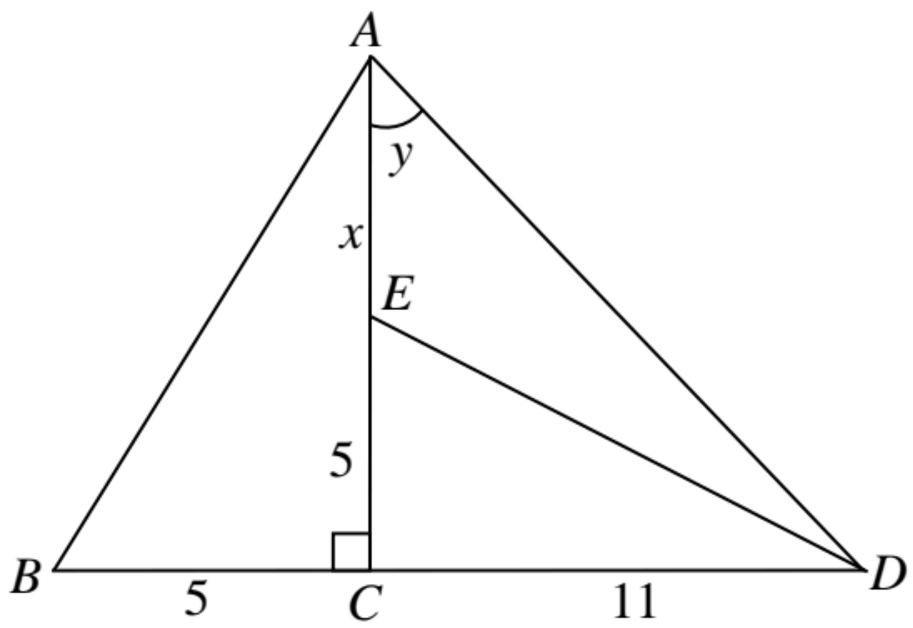


12. In the figure, *FCG* and *CDH* are straight lines and *AB//FG//DE*.



(a) Express $\angle BCF$ in terms of x. (4 marks)
(b) Hence, find the value of x. (3 marks)

13. In the figure, AEC and BCD are straight lines. $AC \perp BD$ and $AB = DE$.



(a) Prove that $\Delta ABC \cong \Delta DEC$. (4 marks)

(b) Find x and y. (4 marks)

14. In the figure, ADC is a straight line. $BD = DC$.

(a) Find x. (3 marks)

(b) Is ΔABD an isosceles triangle? Explain your answer. (4 marks)