

St. Stephen's Girls' College
Final Examination 2015-2016

Form 1
176 students

VC, LHK, KAL, CYN

MATHEMATICS
Paper I
Time Allowed: 1 hour 30 minutes

Name: _____ ()

Class: _____ **Division:** _____

Question No.	Marks	Question No.	Marks
1		8	
2		9	
3		10	
4		11	
5		12	
6		13	
7		14	
		Total	

Instructions:

- Attempt *ALL* questions.
- Write your answers in the spaces provided in this *Question-Answer Paper*.
- *ALL* working must be clearly shown.
- The diagrams in this paper are not necessarily drawn to scale.
- This paper carries 100 marks.

1. The price of a table is \$80 more than 5 times that of a chair. If Peter spends \$4400 to buy 1 table and 4 chairs, find the price of a chair. (4 marks)

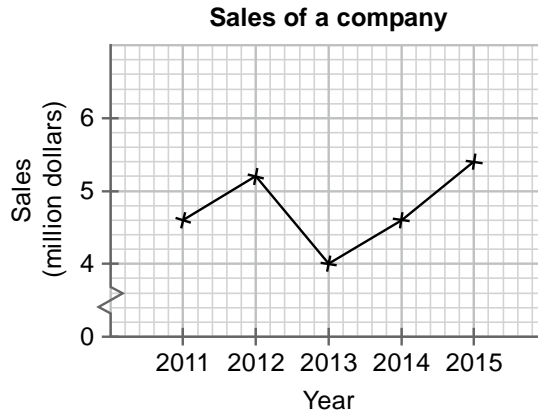
2. It is given that the general term of a sequence is $32 - 3n$.
- (a) Find the 4th term and the 5th term of the sequence. (2 marks)
 - (b) Determine whether -4 is a term of the sequence. Explain your answer. (3 marks)

3. Ming is going to cover his reading room with wall paper. The reading room is 5 m long, 4 m wide and 3 m high. The total area of the room's door and windows is 8 m². If one roll of wallpaper can cover 6 m², find the least number of rolls of wallpaper needed to cover the walls of Ming's reading room. (5 marks)

4. The length and the width of a rectangle are k cm and $(k - 10)$ cm respectively. It is known that the perimeter of the rectangle is not less than 160 cm.

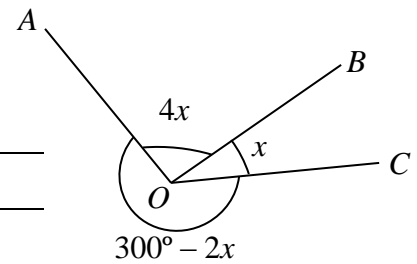
- (a) Set up an inequality to represent the above situation. (1 mark)
- (b) Is it possible that the length of the rectangle is 45 cm? Explain your answer. (3 marks)
- (c) If the perimeter of the rectangle is 216 cm, find its length. (3 marks)

6. The broken-line graph shows the sales of a company from 2011 to 2015.

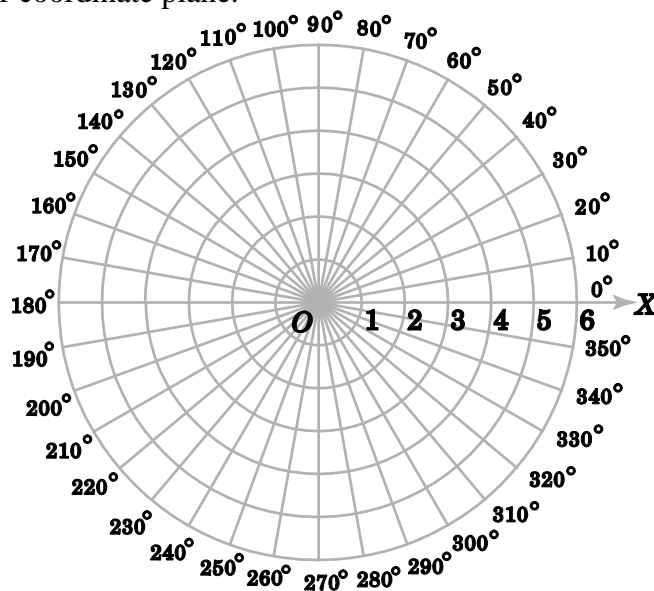


- (a) Between which two years did the sales of the company decrease? Find the decrease in the sales of the company. (2 marks)
- (b) Find the percentage increase of the sales of the company from 2013 to 2015. (2 marks)

7. (a) Find the value of x . (3 marks)
 (b) Find the value of $\angle AOC$. (1 mark)

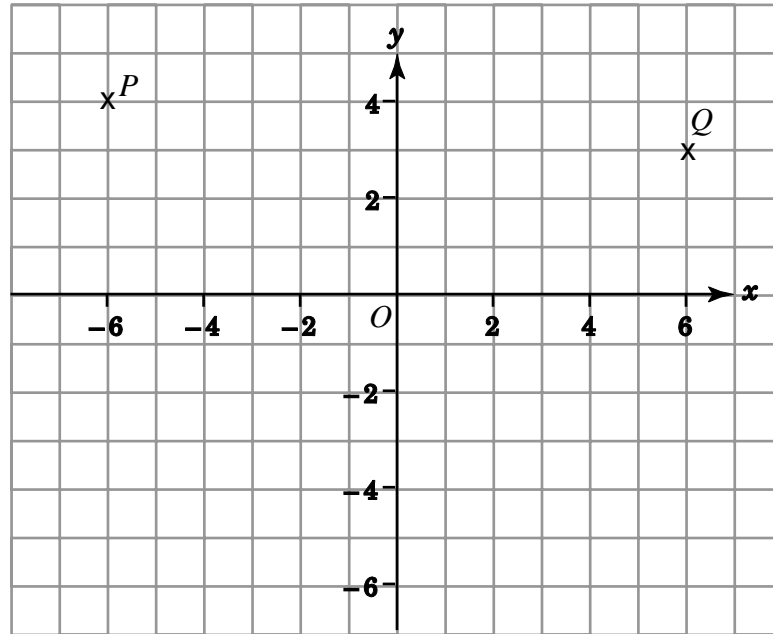


8. The figure shows a polar coordinate plane.



- (a) Plot the points $A(3, 60^\circ)$, $B(4, 150^\circ)$ and $C(5, 240^\circ)$ in the figure. (2 marks)
 (b) Is OA perpendicular to OB ? Explain your answer. (2 marks)
 (c) Find the area of $\triangle ABC$. (2 marks)

9. In the figure, the coordinates of P and Q are $(-6, 4)$ and $(6, 3)$ respectively. P is translated downwards by 10 units to a point S and Q is rotated clockwise about O through 90° to a point R .
- (a) Mark R and S in the figure. Write down the coordinates of R and S . (2 marks)
 - (b) Let T be a point in quadrant IV such that $QT \perp TS$.
 - (i) Mark T in the figure and write down the coordinates of T . (2 marks)
 - (ii) Find the area of trapezium $PQTS$. (3 marks)
 - (c) By using the result of (b)(ii), or otherwise, find the area of quadrilateral $PQRS$. (3 marks)



- (a) The coordinates of R are (____ , ____).
The coordinates of S are (____ , ____).
- (b) (i) The coordinates of T are (____ , ____).

11. The figure shows a rectangular metal tank without any lid. The tank has uniform thickness and the external dimensions of the tank are 40 cm × 20 cm × 50 cm.

(a) Find the external volume of the tank. (2 marks)

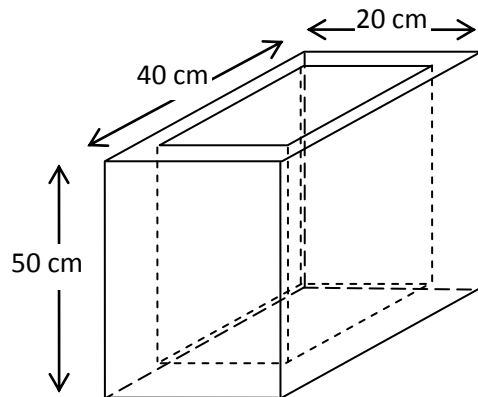
(b) It is given that the thickness of the metal is 1 cm.

(i) Find the capacity of the tank. (3 marks)

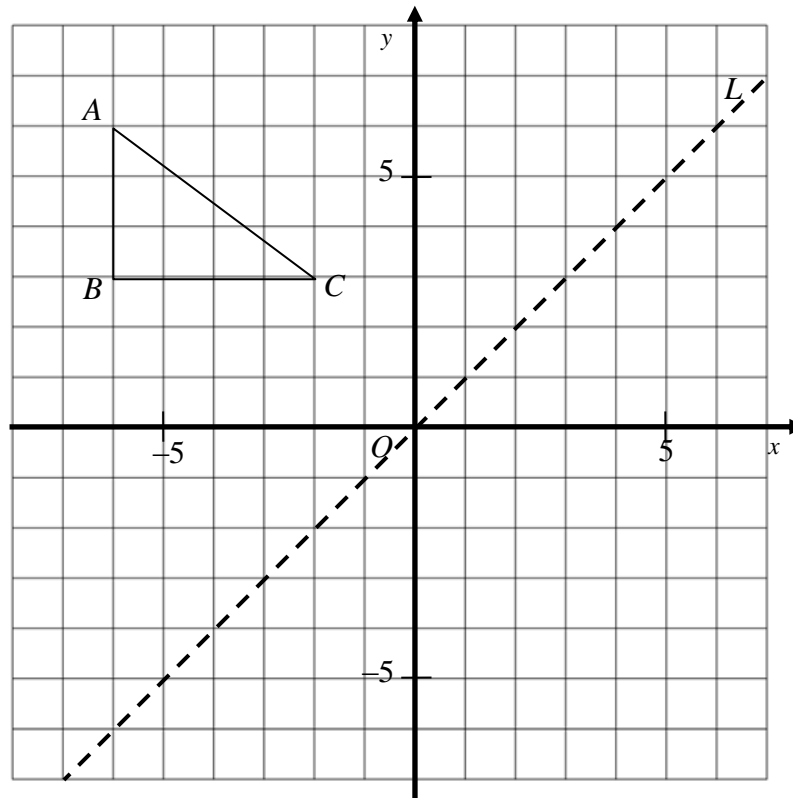
(ii) Find the volume of metal used to make the tank.

(2 marks)

(iii) If 6840 cm³ of water is poured into the tank, find the water level in the tank. (2 marks)



14. The figure shows $\triangle ABC$ in a rectangular coordinate plane.



- (a) In the figure, draw the image after each of the following transformations. (9 marks)
 (All the vertices of the images drawn must be labeled accordingly.)
- (i) $\triangle ABC$ is translated 1 unit to the right and then 2 units downwards to get $\triangle A_1B_1C_1$.
 - (ii) $\triangle A_1B_1C_1$ is reflected in the straight line L to get $\triangle A_2B_2C_2$.
 - (iii) $\triangle A_1B_1C_1$ is rotated through 90° in the clockwise direction about the origin O to get $\triangle A_3B_3C_3$.
- (b) Actually we can get $\triangle A_3B_3C_3$ from $\triangle A_2B_2C_2$ through a single transformation. Describe the transformation in your own words. (2 marks)

*** End of Paper ***