ST. STEPHEN'S GIRLS' COLLEGE

Final Examination 2019 – 2020

Form 1 **LC, LL, JSCL, CYN**

173 students

Mathematics

Time Allowed : 1 hour 15 minutes

Question/Answer Paper

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

1. This paper consists of TWO sections, A and B.

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

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

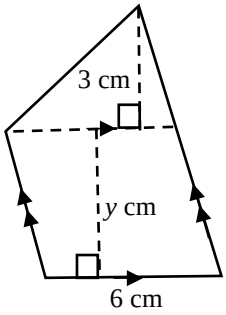
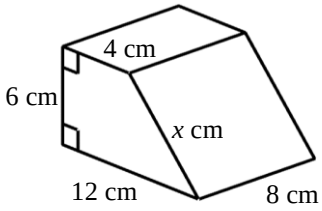
4. The diagrams in this paper are not necessarily drawn to scale.

Class	
Class No.	
Name	
Division	

For Markers' Use Only	
1 – 22.	(50)
23.	(3)
24.	(4)
25.	(7)
26.	(7)
27.	(8)
28.	(8)
29.	(7)
30.	(6)
TOTAL	(100)

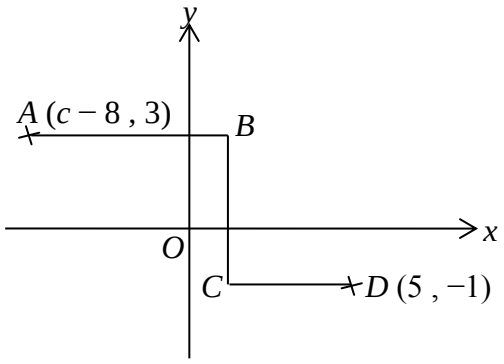
Section A (50%)

All rough work should be done on the rough work paper provided, but will not be marked.

		Answers	Marks
1.	For the algebraic expression $-2x^2-3x-5+4x$, (a) write down the like terms;	1. (a) _____	1
	(b) write down the constant term.	(b) _____	1
2.	Simplify $3b-4(a-b)$.	2. _____	2
3.	Consider the formula $f=d(1-\frac{a}{2})$. If $f=54$ and $a=0.8$, find the value of d.	3. _____	3
4.	In the figure, the area of the polygon is 39 cm^2. Find the value of y. 	4. _____	2
5.	The figure shows a right prism. (a) Find its volume. (b) If the area of all the lateral faces of the prism is 256 cm^2, find the value of x. 	5. (a) _____	2
		(b) _____	2
6.	Which of the following points lies in quadrant IV in a rectangular coordinate plane? $A(-3, -2)$, $B(-4, 1)$, $C(5, -5)$, $D(2, 4)$	6. _____	1
7.	Which of the following points is furthest away from $P(1, 5)$? $A(-3, 5)$, $B(4, 5)$, $C(1, 6)$, $D(1, 3)$	7. _____	2

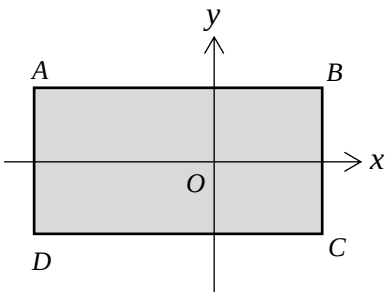
Subtotal: / 16

8. In the figure, AB and CD are parallel to the x-axis. BC is parallel to the y-axis. The coordinates of A and D are $(c - 8\ ,\ 3)$ and $(5\ ,\ -1)$ respectively. If the length of $ABCD$ is 15 units, find the value of c.



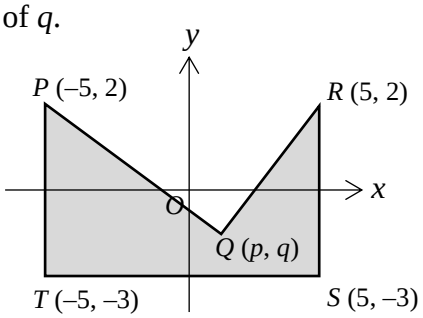
8. _____ 2

9. The figure shows a rectangle $ABCD$, whose sides are either horizontal or vertical. The coordinates of A and C are (–6, 2) and (3, –2) respectively. Find the area of $ABCD$.



9. _____ 2

10. In the figure, the area of $PQRST$ is 35 sq. units. Find the value of q.



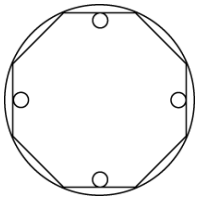
10. _____ 3

11. $A(4,\ 30°)$ and $B(5,\ 120°)$ are two points in a polar coordinate plane. Let O be the pole. Find the area of ΔAOB.

11. _____ 2

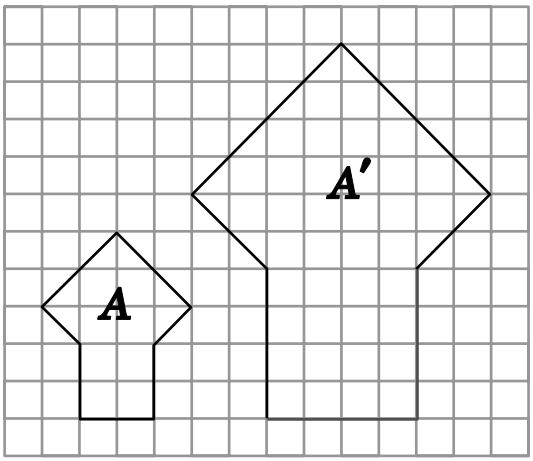
Subtotal: **/ 9**

12. How many axes of symmetry does the following figure have?



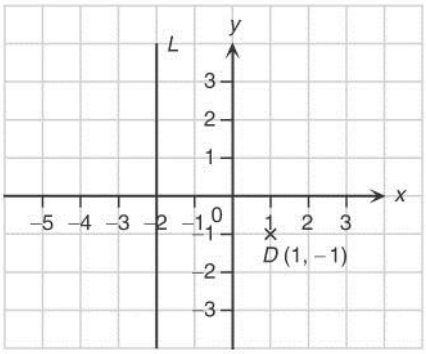
12. _____ 2

13. In the figure, *A*' is the image of *A* after enlargement. Find the enlargement factor.



13. _____ 1

14. In the figure, if *D*(1 , –1) is reflected in the line *L* to *E*, find the coordinates of *E*.



14. _____ 2

15. In a rectangular coordinate plane, a point *A* is rotated anti-clockwise about the origin through 180° to the point *B*(–11 , –8). Find the coordinates of *A*.

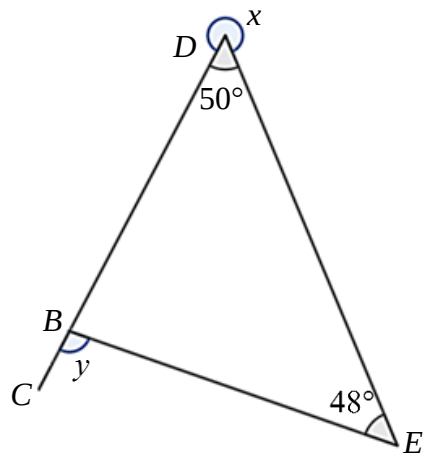
15. _____ 2

16. In a rectangular coordinate plane, a point *P*(2*s* , *s* + 3) is translated 4 units upwards and then reflected in the *x*-axis to the point *Q*(*n* , –10). Find the value of *n*.

16. _____ 2

Subtotal: **/ 9**

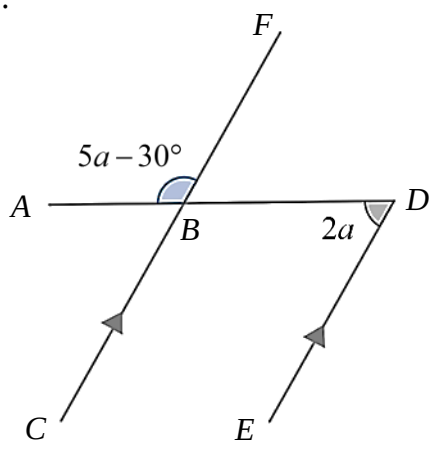
17. In the figure, *CBD* is a straight line. Find *x* and *y*.



17. *x* = _____ 2

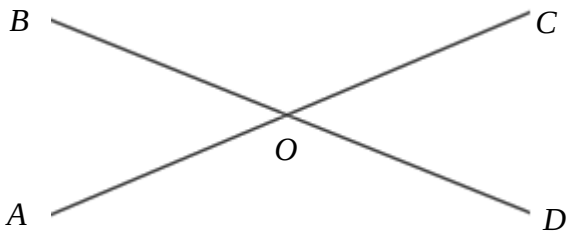
y = _____ 2

18. In the figure, *ABD* and *CBF* are straight lines. Find $\angle ABC$.



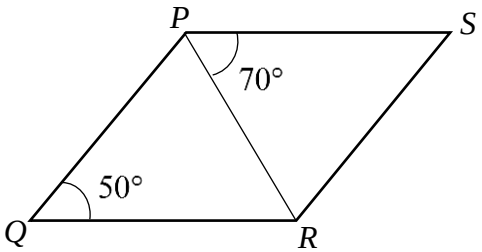
18. _____ 3

19. In the figure, *AOC* and *BOD* are straight lines. If $\angle AOD$ is three times $\angle BOA$, find $\angle BOC$.



19. _____ 2

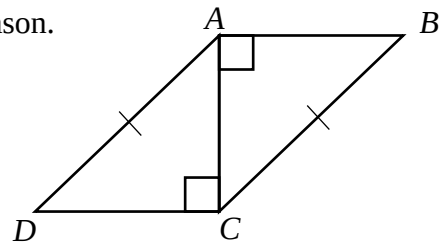
20. In the figure, $\Delta PQR \cong \Delta RSP$. Find $\angle QPR$.



20. _____ 2

Subtotal: **/ 11**

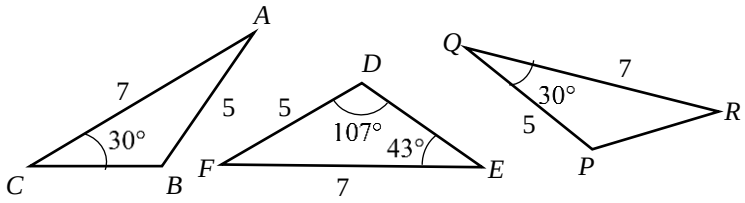
21. In the figure, name a pair of congruent triangles and give a reason.



21. _____ 1

Reason: _____ 1

22. In the figure, name a pair of congruent triangles and give a reason.



22. _____ 2

Reason: _____ 1

Subtotal: / 5

Section B (50%)

All working must be clearly shown in the spaces provided.

23. It is given that the result of subtracting 4 from the product of y and 7 is not greater than −16.

(a) Set up an inequality to represent the above situation. (1 mark)

(b) Is it possible to have $y = -2$? Explain your answer. (2 marks)

24. The price of a box of masks is the same as the price of 4 bottles of bleach. Mrs Chan spent $726 on 2 boxes of masks and 3 bottles of bleach for her family. Find the price of one box of masks. (4 marks)

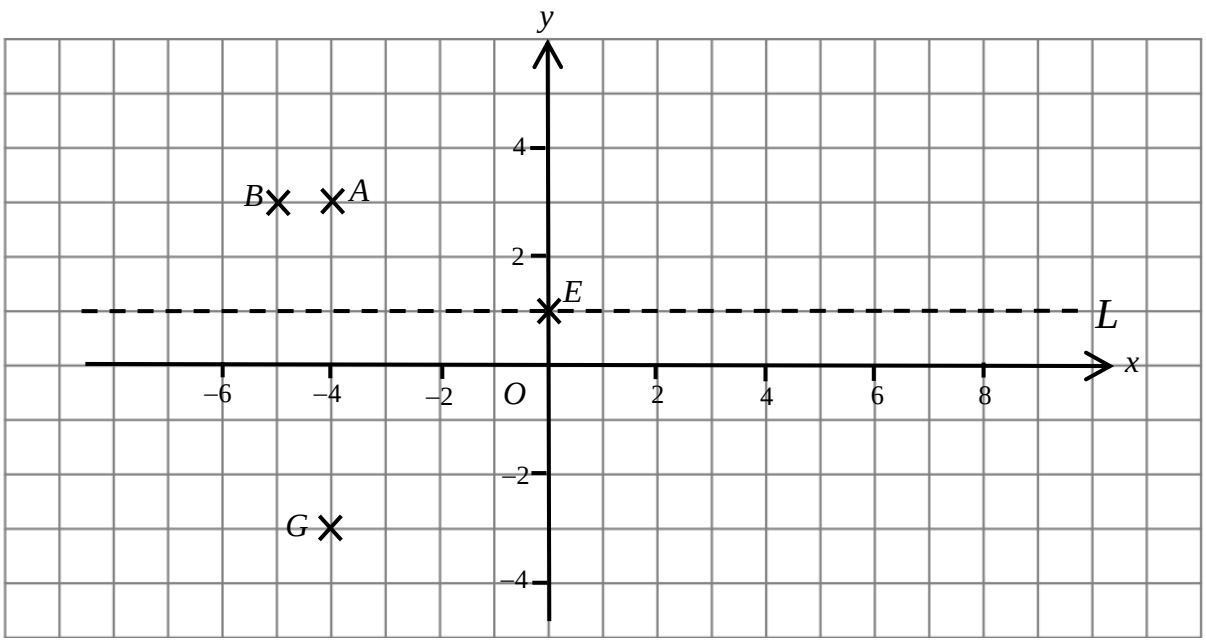
25. In the figure, L is a line parallel to the x-axis and passes through the point E. A is translated 10 units to the right and then translated 2 units downwards to C. B is rotated clockwise about the origin O through 90° to a point D. D is reflected in the line L to F.

(a) Mark C, D and F in the rectangular coordinate plane. (3 marks)

(b) (i) Draw the quadrilateral $CDEF$. (1 mark)

(ii) Find the order of rotational symmetry of the quadrilateral $CDEF$. (1 mark)

(c) If G undergoes a transformation to A, describe the transformation. (2 marks)

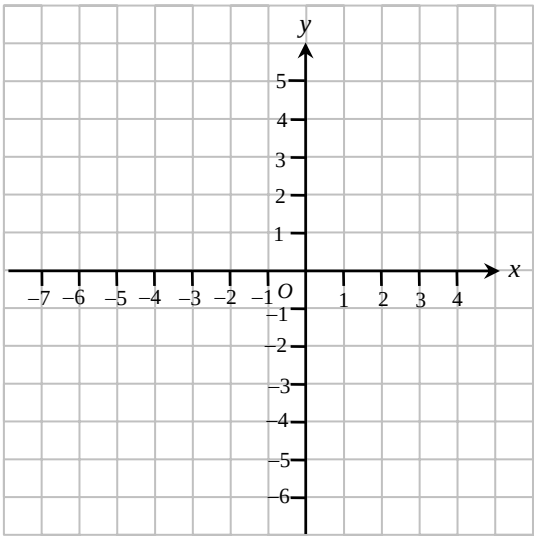


26. The figure shows a rectangular coordinate plane.

(a) (i) Plot the points $A(-3 , 5)$ and $B(-3 , -4)$ in the rectangular coordinate plane. (2 marks)

(ii) Find the length of AB. (1 mark)

(b) $C(6 + 2c , -4)$ is another point in the rectangular coordinate plane. If $BC = 7$ units, find the two possible values of c. (4 marks)



27. Jenny cuts a symmetrical figure from a cardboard. The shape consists of a trapezium and a rectangle which is shown in Figure 1.

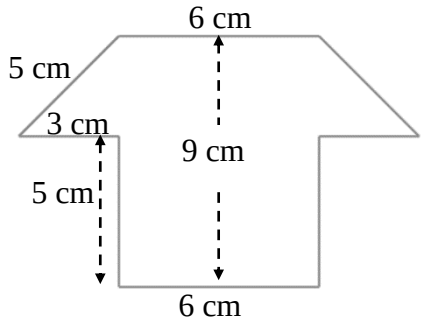


Figure 1

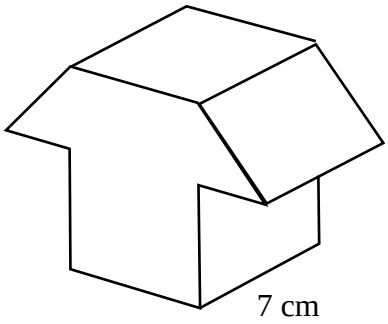


Figure 2

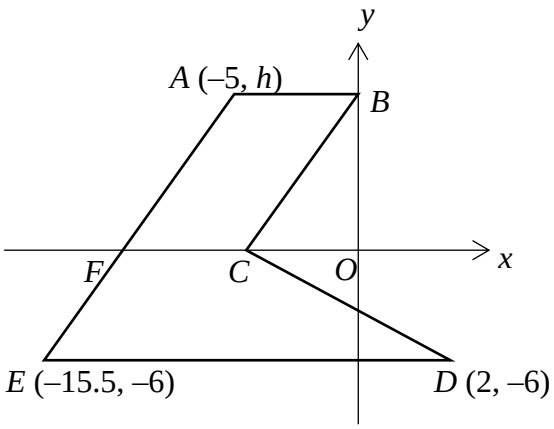
(a) Find the area of the figure shown in Figure 1. (3 marks)

(b) Jenny wants to build a model of a house in the shape of a right prism by using the shape in Figure 1 as the base. (see Figure 2)

(i) Find the volume of the model. (2 marks)

(ii) Jenny claims that the total surface area of the model is smaller than 400 cm^2. Do you agree? Explain your answer. (3 marks)

28. The figure shows a rectangular coordinate plane. B lies on the y-axis and C lies on the x-axis. AE cuts the x-axis at F and $ABCF$ is a parallelogram. It is given that the area of $ABCF$ is 40 sq. units.



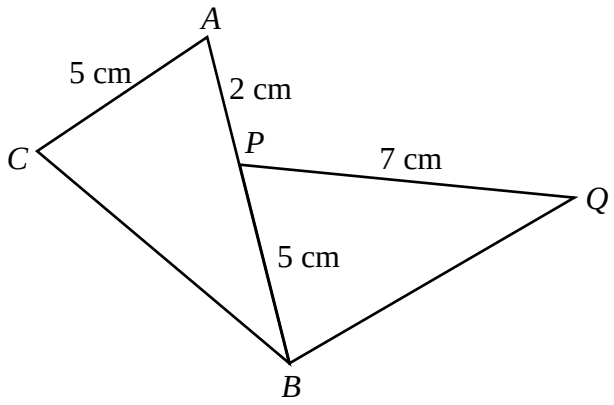
(a) (i) Find the value of h. (2 marks)

(ii) Write down the coordinates of B. (1 mark)

(b) Find the area of $ABCDE$. (2 marks)

(c) Find the area of ΔBCD. (3 marks)

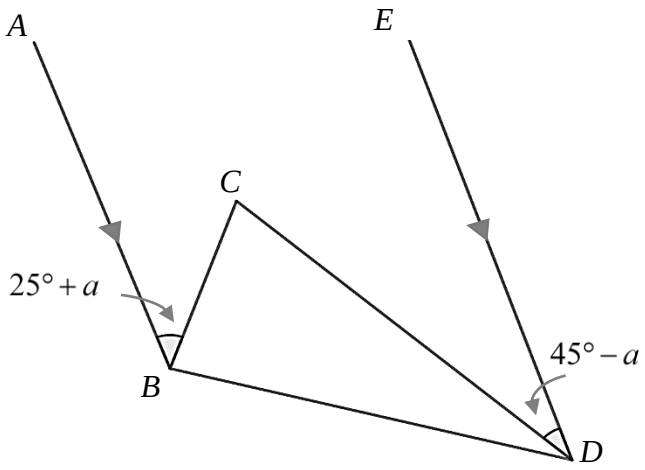
29. In the figure, *APB* is a straight line. It is given that $\angle ACB = 73°$, $\angle CBQ = 116°$ and *BC* = *QB*.



(a) Prove that $\Delta ABC \cong \Delta PQB$. (3 marks)

(b) Find $\angle QPB$. (4 marks)

30. In the figure, *AB* is parallel to *ED*.



(a) Show that $\angle BCD = 70°$. (4 marks)

(b) Given $\angle CDB = 25°$, determine whether *CB* is perpendicular to *BD*. (2 marks)

End of Paper