

St. Stephen's Girls' College
Final Examination 2017-2018

Form 2
170 students

LC, WMC, LL, WYL, CYN

MATHEMATICS
Paper II
Time Allowed: 1 hour

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

Instructions:

- Answer **ALL** questions in the spaces provided in this **Question-Answer Paper**.
- All rough work should be done on the rough work paper provided, but will not be marked.
- The diagrams in this paper are not necessarily drawn to scale.
- Unless otherwise specified, numerical answer should be either exact or correct to 3 significant figures.
- This paper carries 100 marks.

Marks:

/ 100

	<u>Answers</u>	<u>Marks</u>
1. Simplify $\left(\frac{a}{b}\right)^3 \times a^4$.	1. _____	2
2. Expand the following expressions.	2. _____	
(a) $b(2b + 1)$	(a) _____	1
(b) $(x + 3)(4 - 2x)$	(b) _____	2
3. If $x = 6$ is a solution of $3(x - 3) = 4(x + k) - 7$, find k .	3. _____	3
4. Determine whether the following statements are true or false and circle the correct answers.	4. _____	
(a) $2x^2 - 8 = 2(x - 2)^2$	(a) True / False	1
(b) $(9a - b)(9a + b) = 18a^2 - b^2$	(b) True / False	1
(c) $(-a + 4)^2 = (-4 + a)^2$	(c) True / False	1
5. If $(2x + 3)(x + a) \equiv 2x^2 + b(x + 1)$, find the value of a .	5. _____	3
6. The volume of a solid is measured as 200 cm^3 , correct to 2 significant figures. Find the upper limit of the actual volume of the solid.	6. _____	2
7. The base and the height of a triangle are measured as 6.0 cm and 2.0 cm correct to the nearest 0.5 cm respectively. Let $x \text{ cm}^2$ be the actual area of the triangle. Find the range of values of x .	7. _____	3
8. Solve $\begin{cases} x - 4y = 5 \\ x + 4y = 9 \end{cases}$.	8. $x =$ _____ $y =$ _____	1 1
9. Mark bought 2 bars of chocolate and 2 bottles of apple juice for \$26. Susan bought 1 bar of chocolate and 4 bottles of apple juice for \$37. How much is a bottle of apple juice?	9. _____	2
10. (2, 3) is the solution of the simultaneous equations $\begin{cases} 4x + 3y = 17 \\ x - y = -1 \end{cases}$. Solve $\begin{cases} \frac{4}{x} + 9y = 17 \\ \frac{1}{x} - 3y = -1 \end{cases}$.	10. $x =$ _____ $y =$ _____	2 2

Subtotal: / 27

11. The following frequency distribution table shows the time taken (in min) by a group of students to finish their lunch.

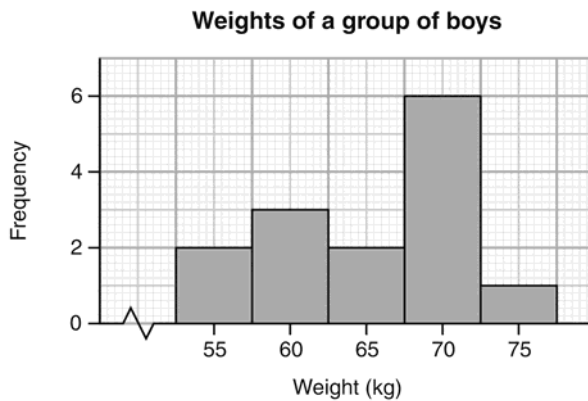
Time (min)	8 – 12	13 – 17	18 – 22	23 – 27	28 – 32
Frequency	6	12	18	10	4

- (a) If the time taken by a student is 27.5 minutes, which class interval does it belong to?
- (b) Find the class width of each class interval.
- (c) Find the percentage of students who finish their lunch in less than 17.5 minutes.

11.

- (a) _____ 1
- (b) _____ 1
- (c) _____ 2

12. The following histogram shows the weight distribution of a group of boys.

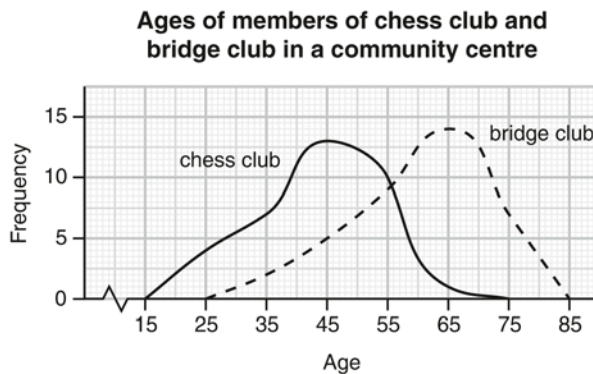


- (a) How many boys are in the group?
- (b) What is the lowest possible weight of the heaviest boy?

12.

- (a) _____ 2
- (b) _____ 2

13. The following frequency curves show the distribution of the ages of members of the chess club and the bridge club in a community centre. Determine whether the members of the chess club or the bridge club are older on the whole.



13.

_____ 1

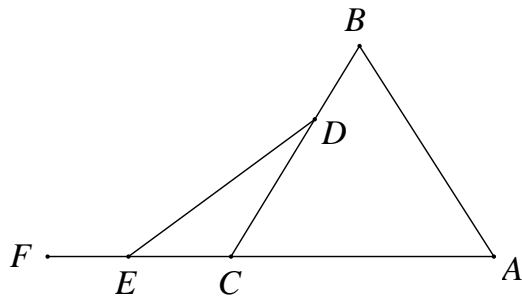
14. A shop sells 518 pairs of shoes in 2 weeks. Express the rate of selling shoes in pairs/day.

14.

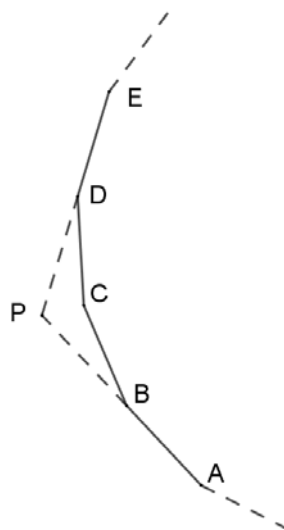
_____ 2

Subtotal: / 11

15. Jay's home is 1.8 km from his office. His average walking speed is 1.2 m/s. If he leaves home and walks to his office at 6:30 a.m., when will he arrive at his office?
16. If $6x = 7y$, find $x : y$.
17. If $a : b = 4 : 9$ and $a : c = 3 : 7$, find $a : b : c$.
18. The prices of a book and a dictionary are in the ratio 4 : 5, and the price of the book is \$50 lower than that of the dictionary. Find the price of the book.
19. If the length of a highway on a map is 8 cm and its actual length is 12 km, express the scale of the map in the form 1 : n .
20. In the figure, $ACEF$ and BDC are straight lines, $\triangle ABC$ is an equilateral triangle and $\angle CDE = 22^\circ$. Find $\angle DEF$.



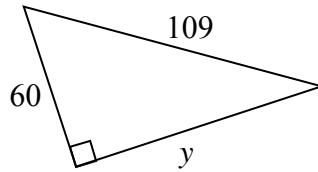
21. In $\triangle ABC$, $AB = AC$ and $\angle B = 46^\circ$. Find $\angle A$.
22. Find the sum of interior angles of a 22-sided polygon.
23. The size of each interior angle of a regular n -sided polygon is 150° . Find the value of n .
24. In the figure, $ABCDE$ is a part of a regular polygon. AB produced and ED produced intersect at P . If $\angle C = 162^\circ$, find $\angle P$.



15. _____	3
16. _____	2
17. _____	2
18. _____	2
19. _____	2
20. _____	3
21. _____	2
22. _____	3
23. _____	3
24. _____	3

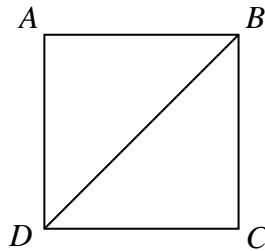
Subtotal: / 25

25. In the figure, find the value of y .



25. _____ 2

26. In the figure, $ABCD$ is a square. If the area of $ABCD$ is 32, find the length of BD .



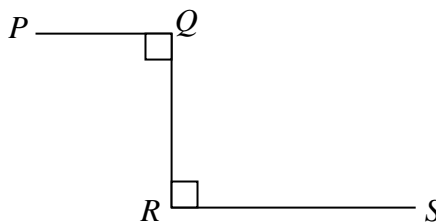
26. _____ 2

27. In $\triangle DEF$, $\angle E = 90^\circ$ and $DE = 20$ cm. If the area of $\triangle DEF$ is 210 cm^2 , find the perimeter of $\triangle DEF$.

27. _____ 3

28. In the figure, $PQ = x$ cm, $QR = 8$ cm and $RS = 10$ cm. If the distance between P and S is $(x + 12)$ cm, find the value of x .

28. _____ 3



29. Simplify the following expressions:

29. _____

(a) $\sqrt{48} + \sqrt{12}$

(a) _____ 2

(b) $\sqrt{3} \times \sqrt{18}$

(b) _____ 2

30. In the figure, M is the mid-point of QR . If $PQ = 5$ and $QR = 8$, find

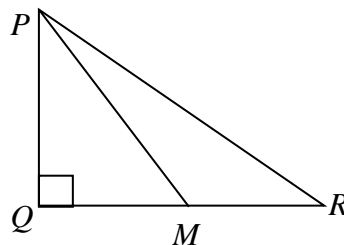
30. _____

(a) $\angle PMQ$,

(a) _____ 2

(b) $\angle MPR$.

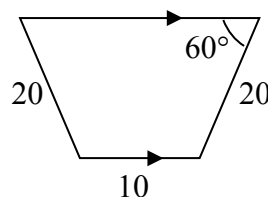
(b) _____ 3



31. In the figure, find the area of the trapezium.

31. _____ 3

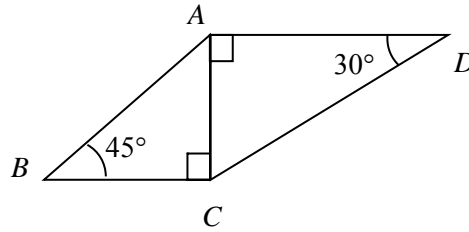
(Leave the radical sign “ $\sqrt{\quad}$ ” in the answer.)



Subtotal: / 22

32. In $\triangle ABC$, $\angle B = 90^\circ$, $AC = 5$ and $BC = 4$.
Find $\angle A$ and $\angle C$.

33. In the figure,
 $AB : CD = 1 : n$.
Find the value of n .
(Leave the radical sign “ $\sqrt{\quad}$ ” in the answer.)



34. If x is an acute angle such that $\cos x = \frac{4}{7}$, find the value of $\tan x$ in surd form. Simplify and rationalize the denominator of your answer if necessary.
35. Find the acute angle x in each of the following.

(a) $\tan 2x = \frac{1}{\tan 30^\circ}$

(b) $\cos 5x = \sin 4x$

32.	$\angle A =$ _____	2
	$\angle C =$ _____	2
33.	_____	3
34.	_____	3
35.		
	(a) _____	2
	(b) _____	3

Subtotal: / 15

---End of Paper ---