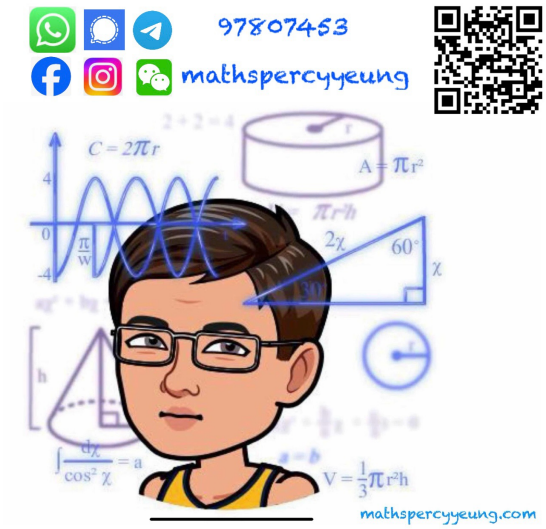
Mid-Year Examination 2020 – 2021

Form 1

176 students



Mathematics
Time Allowed : 1 hour
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.

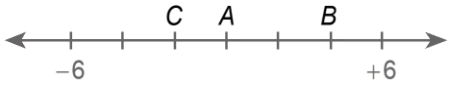
3. This paper carries 100 marks. Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question/Answer Paper.

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

For Markers' Use Only	
1 – 24.	(58)
25.	(3)
26.	(5)
27.	(5)
28.	(7)
29.	(3)
30.	(7)
31.	(6)
32.	(6)
TOTAL	(100)

Section A (58%)

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

			Answers	Marks
1.	Express 112 as a product of prime factors using index notation.	1.	_____	2
2.	Find the L.C.M. of $2^2 \times 5$, $2^3 \times 3$ and $3^2 \times 5$.	2.	_____	2
3.	If 435★ is divisible by 6, write down all the possible values of ★.	3.	_____	2
4.	Arrange the following numbers in ascending order: $-\frac{3}{5}$, +1.2, $+2\frac{1}{2}$, 0, $-\frac{3}{4}$	4.	_____	2
5.	Evaluate $(-21)+(-9)\div(+1\frac{1}{2})$.	5.	_____	2
6.	*A, B* and *C* are three numbers represented on the number line below. Find the value of $(A-C)\div B$. 	6.	_____	3
7.	A bee flies 3 m to the south and 2 m to the north. It then flies 1.5 m to the south again. Express the final position of the bee in a directed number. ('+1 m' represents a position 1 m to the north of the starting point.)	7.	_____	2
8.	Represent the following word phrase by an algebraic expression: Subtract *q* from half of *p* and multiply the difference by the cube of *r*.	8.	_____	2
9.	Simplify the following expression: $(b-2b)^2+3b\div 3$	9.	_____	3
10.	Which of the following is NOT a formula? A. $a^2+b^2=c^2$ B. $V=\frac{4}{3}r^3$ C. $A-\pi r^2$ D. $\frac{(w+l)d}{2}=A$	10.	_____	2
			Subtotal:	**/22**

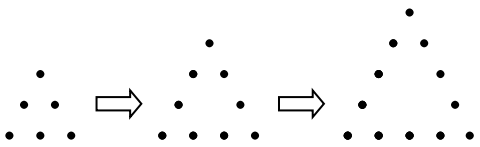
11. Consider the formula $D = \dfrac{b^2 - 4ac}{c}$. If $a = -2$, $b = 3$ and $c = \dfrac{1}{2}$, find the value of D.

11. _____ 3

12. If $a_n = \dfrac{n-3}{n+2}$, find $a_5 - a_2$.

12. _____ 3

13. In the figure, the 1st pattern consists of 6 dots. For any positive integer n, the $(n + 1)^{th}$ pattern is formed by adding 3 dots to the n^{th} pattern. Find the number of dots in the 6^{th} pattern.



13. _____ 3

14. Simplify $13 - 2(x - 3)$.

14. _____ 2

15. Solve the following equations.

(a) $12 = 2(3x - 9)$

(b) $\dfrac{a+9}{3} = 11 - a$

15.
(a) $x =$ _____ 2

(b) $a =$ _____ 2

16. John is four times as old as his son now. Two years later, John will be 38 years old. Find the present age of his son.

16. _____ 3

17. Which of the following angle is the largest?

A. $\dfrac{6}{5}$ of a right angle

B. $\dfrac{3}{4}$ of a straight angle

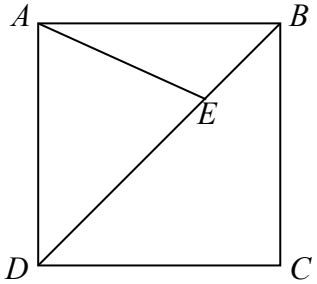
C. $\dfrac{1}{3}$ of a round angle

17. _____ 2

18. In the figure, $ABCD$ is a square. E is a point on BD such that $DA = DE$. Name

(a) an isosceles triangle,

(b) a scalene triangle.



18.

(a) _____ 1

(b) _____ 1

Subtotal: /22

19.	If 12% of b is 48, find the value of b.	19. _____	2
20.	There are 32 children in a playground and $18\frac{3}{4}\%$ of them are girls. How many boys are there in the playground?	20. _____	2
21.	If 28 students in the class passed the first Mathematics test and 21 students in the class passed the second Mathematics test, find the percentage change in the number of students who passed the test.	21. _____	2
22.	A jewellery shop offers a 15% discount on all the items sold. If the marked price of a ring is \$6380, find the selling price.	22. _____	2
23.	A shop offers a sale such that customers can 'buy 8 get 2 free' for all items. If Janet wants to buy 10 towels, find the percentage discount.	23. _____	3
24.	Mr. Lam sold a table and a chair for \$728, with a percentage loss of 9%. If he bought the table for \$560, find the cost price of the chair.	24. _____	3
		Subtotal:	**/14**

Section B (42%)

25. (a) Write down all the prime numbers between 20 and 30. (1 mark)
    (b) Find the sum of squares of all the numbers in (a). (2 marks)

26. In a stationery shop, the prices of a pen and a pencil are \$16 and \$9 respectively. Mary bought some pens and pencils for her friends as Christmas gifts. The number of pens she bought is $\frac{3}{2}$ of that of the pencils. If the total price she paid is \$132, find the number of pens and pencils she bought respectively. (5 marks)

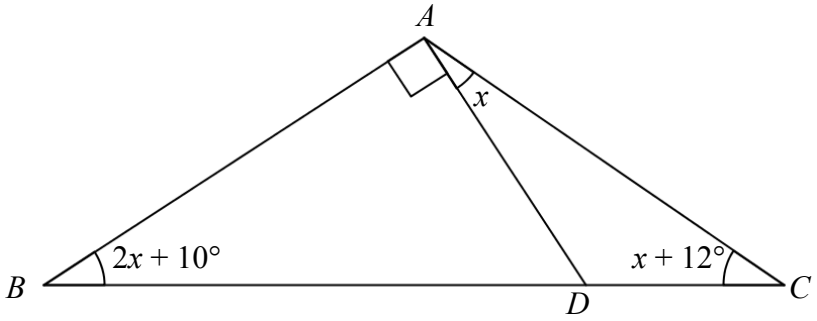
27. In a baking class, Jane places an empty container on an uncorrected electronic balance. The reading of the balance before placing the container is −56.3 g. Then Jane adds 15 sugar cubes into the container and the reading of the balance becomes 71.9 g. It is given that the actual weight of the container is 71.2 g and all the sugar cubes have the same weight.
    (a) Find the total weight of the sugar cubes. (2 marks)
    (b) After removing some sugar cubes, the reading of the balance becomes 49.1 g. Find the number of sugar cubes left in the container. (3 marks)

28. Jessie and Peter have \$95a and \$50a respectively. Jessie transfers \$1.5a to Peter each time.

(a) Find the amount of money Jessie and Peter have respectively after the first time of transfer. (3 marks)

(b) Suppose Peter has more money than Jessie after N times of transfer. Find the difference between the amount they have when $a = 30$. (4 marks)

29. In the figure, BDC is a straight line. Find x. (3 marks)



30. It is given that the general term a_n of a sequence is $9 + 3n$.

(a) Write down the first three terms of the sequence. (1 mark)

(b) If $a_r = 42$ find the value of r. (2 marks)

(c) If $\frac{a_m}{3} - \frac{a_{m+1}}{11} = 7$, find the value of m. (4 marks)

31. The following table summarizes the time taken by each athlete in a 4 × 100 m relay team to run 100 m during practice.

Athlete	*A*	*B*	*C*	*D*
Time (s)	13.0	12.5	12.0	12.5

In the race, athletes *A* and *B* reduce their time by 5% and 2% respectively.

(a) Find the new time taken by athlete *A* and the new time taken by athlete *B* in the race. (3 marks)

(b) Suppose there are no changes in the time taken by athletes *C* and *D* in the race. Susan claims that the percentage decrease in their time to finish the 4 × 100 m relay race exceeds 2%. Do you agree? Explain your answer. (3 marks)

32. In a boutique, all items are sold at 20% off. If a customer spends more than \$700, an extra discount of 5% will be offered.
    (a) Mary buys a dress for \$240. What is the marked price of the dress? (2 marks)
    (b) If Mary buys the dress in (a) and a handbag marked \$630, how much should she pay? (4 marks)

--- End of Paper ---