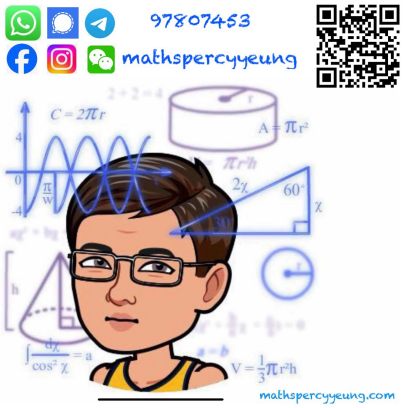
Mid-year Examination 2022 – 2023

Form 1

144 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 – 25.	(58)
26.	(3)
27.	(5)
28.	(3)
29.	(6)
30.	(5)
31.	(7)
32.	(7)
33.	(6)
TOTAL	(100)

Section A (58%)

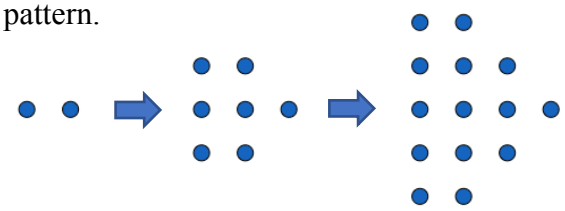
All rough work should be done on the rough work paper provided, but will not be marked.

		Answers	Marks
1.	Find the result when the square of 5 is subtracted from the cube of –2.	1. _____	2
2.	Find the L.C.M. of $3^3 \times 5 \times 11$ and $2 \times 3 \times 5^2$.	2. _____	2
3.	Express 792 as a product of prime factors using index notation.	3. _____	2
4.	If 3Δ86 is a 4-digit number which is divisible by 6, find all the possible values of Δ.	4. Δ = _____	2
5.	Evaluate $\dfrac{2-(-2)(-4)}{[1-(-4)]^2-2}$.	5._____	2
6.	Arrange the following numbers in descending order: -0.6, 0, $-\dfrac{2}{3}$, 2.4, $\dfrac{15}{7}$	6. _____	1
7.	A company made a profit of \$23 000 in May, suffered a loss of \$20 000 in June, suffered a loss of \$17 000 in July and made a profit of \$8 000 in August. What is the overall profit or loss of the company over these four months?	7. _____	2
8.	Represent the following word phrases by an algebraic expression: (a) Multiply the sum of the square of *a* and *m* by 5. (b) Divide the product of 4 and *y* by the cube of *x*.	8. (a) _____ (b) _____	2 2
9.	Simplify the following algebraic expressions. (a) $7 \times 2a - 2a \div 2$ (b) $3(3b + 5c) - (4c + 6b)$	9. (a) _____ (b) _____	2 2
10.	Consider the formula $B = \dfrac{1-d}{c+d}$. Find the value of *B* if $c = \dfrac{1}{3}$ and $d = -2$.	10. _____	2
		Subtotal:	**/23**

11. Consider the formula $a = \dfrac{v^2 - u^2}{2s}$. If $v = 8$, $u = -2$ and $s = 5$, find the value of a.

11. _____ 2

12. In the figure, the 1st pattern consists of 2 dots. For any positive integer n, the $(n + 1)^{th}$ pattern is formed by adding $(2n + 3)$ dots to the nth pattern. Find the number of dots in the 5th pattern.



1st pattern 2nd pattern 3rd pattern

12. _____ 2

13. Ivan's monthly salary is \$$x$ each month. Mary's monthly salary is twice that of Ivan's. Find the sum of the salaries of Ivan and Mary in three months in terms of x.

13. _____ 2

14. Solve the following equations.

(a) $\dfrac{x+8}{3} = 10 + 4x$

(b) $3(y + 2) - 2(8 + y) = -7$

14. (a) $x =$ _____ 2

(b) $y =$ _____ 2

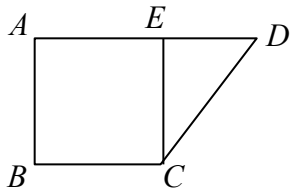
15. There are x \$2 coins and $(x - 3)$ \$5 coins in a bag. If the total amount in the bag is \$34, find the value of x.

15. $x =$ _____ 2

16. If the sum of three consecutive odd numbers is 117, find the largest number.

16. _____ 3

17. In the figure, AED is a straight line. $ABCE$ is a square where $AB = 5$ m. If the area of $ABCD$ is 45 m^2, find the length of ED.



17. _____ 2

18. Find the sum of $\dfrac{1}{10}$ of a round angle and $\dfrac{3}{4}$ of a straight angle. Express your answer in degrees.

18. _____ 2

19. If 28% of n is 42, find the value of n.

19. _____ 2

Subtotal: /21

20.	What percentage of 16 is 40?	20. _____	2
21.	The original volume of hand sanitizer in a bottle was 650 mL. If there are still 429 mL hand sanitizer left in the bottle now, find the percentage change in the volume of hand sanitizer.	21. _____	2
22.	The weight of a backpack decreases by 52% to 1.68 kg after taking out some textbooks. Find the original weight of the backpack.	22. _____	2
23.	The cost of a handbag is \$225. If the percentage profit is 36%, find the profit.	23. _____	2
24.	The marked price of an umbrella is \$240. If it is sold at a discount of 20%, the profit will be \$32. Find the cost of the unbrella.	24. _____	3
25.	Susan bought a necklace for \$2 040 and sold it to Mary at a loss of 15%. If Mary then sold the necklace for \$1 300.5, find the percentage loss for Mary.	25. _____	3

Subtotal: **/14**

Section B (42%)

All working must be clearly shown in the spaces provided.

26. Simplify $\frac{1}{2}(a-2b)+\frac{3a-4b}{2}$. (3 marks)

27. In a quiz between Team *A* and Team *B*, each team would get 5 marks for a correct answer and lose 2 marks for a wrong answer or no response.
    (a) Team *A* got 14 correct answers and 6 wrong answers. What was its score? (2 marks)
    (b) Team *B* also got 14 correct answers but its score was 8 marks less than that of Team *A*. How many wrong and no response answers did Team *B* get? (3 marks)

28. The price of a cup of coffee is $\$p$ and the price of a cup of hot chocolate is $\$q$. Ricky buys 7 cups of coffee and 2 cups of hot chocolate. The change is \$8. How much does Ricky pay? (Express your answer in terms of p and q.) (3 marks)

29. The general term a_n of a sequence is $17 - 3n$.

(a) Find a_2. (1 mark)

(b) If $7a_s - a_2 = 3$, find the value of s. (3 marks)

(c) Is –21 a term of the sequence? Explain your answer. (2 marks)

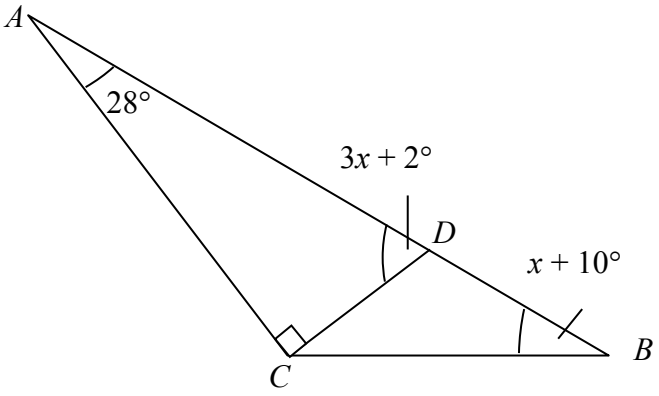
30. The perimeter of a triangle is 64 cm. The length of the shortest side of the triangle is 15% of the perimeter.
    (a) Find the length of the shortest side. (2 marks)
    (b) The shortest side is shorter than the longest side of the triangle by 68%. Find the length of the longest side? (2 marks)
    (c) Find the length of the remaining side of the triangle. (1 mark)

31. Mary wants to buy a jacket with the marked price of \$520 and at a discount of 15%.
    (a) Find the selling price of the jacket. (2 marks)
    (b) Mary can use either one of the following methods to get an extra discount on the selling price of the jacket in (a):

        Method I: Use her VIP card and get an extra 10% discount.
        Method II: Use her birthday discount of \$50.

        (i) Which method should Mary use? Explain your answer. (3 marks)
        (ii) The cost of the jacket is \$313.6. Find the percentage profit when using the method selected in (b)(i). (2 marks)

32. In the figure, ADB is a straight line and $AC \perp CD$. $\angle CAD = 28°$, $\angle ADC = 3x + 2°$ and $\angle DBC = x + 10°$.



(a) Find x. (2 marks)

(b) Find $\angle DCB$. (3 marks)

(c) It is known that the area of ΔABC and the area of ΔDBC are 45 and 15 respectively. If $AC = 12$ and $AD = 13$, find the perimeter of ΔACD. (2 marks)

33. Some \$2-stamps are shared among Amy and Barry. The number of stamps obtained by Barry is 3 times that obtained by Amy. Afterwards, Barry gives 18 stamps to Amy. Suppose Amy has x stamps originally.
    (a) (i) Find the new number of stamps obtained by Barry in terms of x. (1 mark)
    (ii) Find the new number of stamps obtained by Amy in terms of x. (1 mark)
    (b) It is given that the new number of stamps obtained by Barry is 7 less than half of that of Amy. Find the total value of the stamps obtained by Amy and Barry altogether. (4 marks)

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