KTGSS F3 Final 2023-2024 Paper one
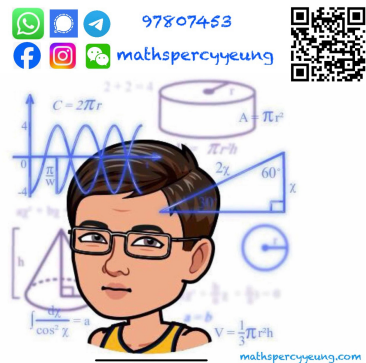
Class	: S 3 ( )	Max. Mark	: 100
Name	: _____	Date	: 12 − 6 − 2024
Class No.	: _____	Time	: 8:30 am − 10:00 am

INSTRUCTIONS

1. Use of H.K.E.A.A. approved calculators is allowed.

2. This paper consists of THREE sections, Section A(1), A(2) and B.

3. Answer ALL questions in this paper. Write your answers in the spaces provided in this Question-Answer Book. All working must be clearly shown.

4. Unless otherwise specified, numerical answers must either be exact or correct to 3 significant figures.

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

Section A(1) : 40 marks

1. Simplify $\dfrac{x^{10}y^{-4}}{\left(x^{-2}y^3\right)^5}$ and express your answer with positive indices. (4 marks)

2. Factorize

   (a) $3a^2 - a - 4$,

   (b) $3a^2 - a - 4 - 12ab + 16b$.

   (4 marks)

3. The following diagram shows the monthly savings of Rachel last year.

Monthly savings of Rachel last year
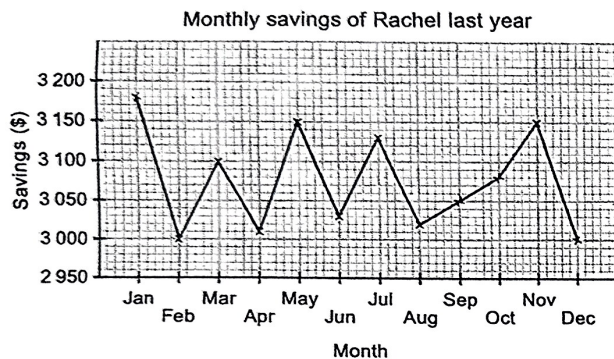
(a) Find the difference between the maximum and minimum monthly savings of Rachel last year.

(b) After reading the diagram above, Ben claimed that the monthly savings of Rachel went up and down significantly last year. Do you agree with the claim of Ben? Explain briefly.

(4 marks)

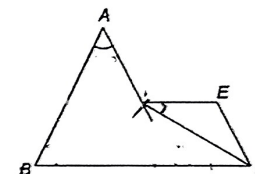4. (a) Solve $\dfrac{19-5x}{4}-1>-2x$ and represent your solution graphically.

(b) Write down the total number of negative integers that satisfying your answer in (a).

(5 marks)

5. In the figure, CDEF is a rhombus. AFC and BCD are straight lines. Given $AB = AC$ and $\angle BAC = 42°$.

(a) Find $\angle ACB$.

(b) Hence, find $\angle DFE$.

(5 marks)

6. In a park, there were 4000 customers on Monday. The number of customers in the park increased by 30% on Tuesday and then decreased by 40% on Wednesday.

(a) Find the number of customers in the park on Wednesday.

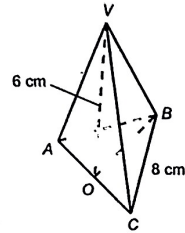(b) Find the overall percentage change in the number of customers in the park from Monday to Wednesday.

(6 marks)

7. The figure shows the pyramid $VABC$ of height 6 cm and its base is an equilateral triangle of sides 8 cm.

   O is the mid-point of AC.

   (a) Find OB.

   (b) Hence, find the volume of the pyramid.

   (6 marks)

8. The surface area of a sphere is 144π cm^2. Find

   (a) the radius of the sphere,

   (b) the volume of the sphere. (Express your answers in terms of π if necessary.)

   (6 marks)

Section A(2) : 40 marks

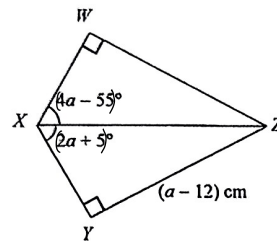9. Simplify $\dfrac{\tan\theta\sin(90°-\theta)}{(\cos\theta-\sin\theta)^2+2\cos\theta\cos(90°-\theta)}$. (4 marks)

10. The marked price of a calculator is 40% higher than its cost. The calculator is sold at a discount of 25% on its marked price and the profit is $13. Find the marked price of the calculator. (5 marks)

11. In the figure, XZ is the angle bisector of $\angle WXY$. $XW \perp WZ$ and $XY \perp YZ$.

(a) Find a.

(b) Find WZ.

(5 marks)

W

X $\angle(4a - 55)^\circ$ $\angle(2a + 5)^\circ$ Z

$(a - 12)$ cm

Y

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12. The stem-and-leaf diagram below shows the distribution of the numbers of hours spent on doing assignments in a month by a class of students.

Stem (tens)	Leaf (units)
3	0 2 2 3 5 6 7 9
4	n n n 4 5 7
5	0 1

The median of the distribution is 41.

(a) Find n.

(b) Someone claims that the mean is less than the mode of the distribution. Do you agree? Explain your answer briefly.

(6 marks)