

Name: _____ ()

Class: _____



華僑中學

HWA CHONG INSTITUTION
PAPER G

MATHEMATICS

Level : Secondary One

Duration : 2 hours

Do not open this booklet until you are told to do so.

INSTRUCTIONS TO CANDIDATES

Write your name, class and index number on all the work you hand in.

Answer **all** questions.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For π , use either your calculator value or 3.142, unless the question requires the answer in terms of π .

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 80.

You are expected to use an electronic calculator to evaluate explicit numerical expressions. **The use of a graphing calculator is not permitted.**

You are reminded of the need for clear presentation in your answers. Omission of essential working will result in loss of marks.

This question paper consists 6 printed pages, including this page.

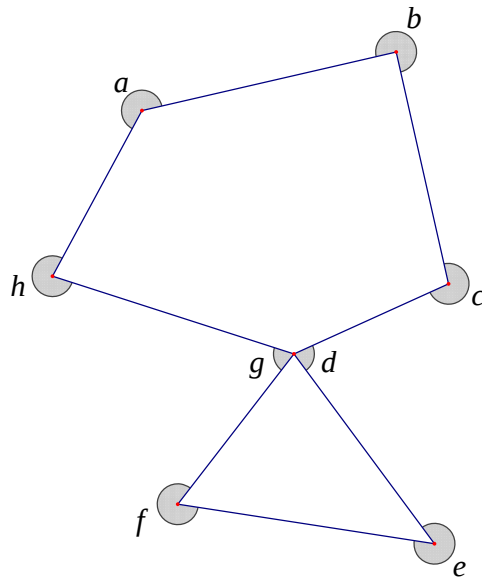
- 1 Evaluate $\frac{10 + \sqrt{100 - 9 \times (-2) \times 8}}{3}$, giving your answer to
- (i) 4 decimal places, [1]
 - (ii) 4 significant figures. [1]
- 2
- (i) Express 4536 as a product of its prime factors. [1]
 - (ii) Given that $\frac{4536}{k} = p^2$, where k and p are integers and p is as large as possible, find the values of k and p . [2]
 - (iii) The lowest common multiple of two numbers is 4536. The highest common factor of these two numbers is 189. Both numbers are greater than 189. Find the two numbers. Show your working clearly. [2]
- 3
- (a) List all the integers that satisfy $-2 \leq x < 4$. [1]
 - (b) Solve the inequalities $3 \leq 4x + 5 < 9$. [2]
- 4
- (a) Simplify $\frac{1}{3}(3x - 6y - 12) - 2(4y - 3x) + 3x$. [3]
 - (b) Factorise $10ap + 3bq - 2bp - 15aq$ completely. [2]
- 5
- (a) Solve $\frac{x-1}{2} = \frac{2(3x-10)}{5}$. [3]
 - (b) **Without** the use of a calculator, evaluate $\sqrt{(-2)^3 - 15 \div \left(-\frac{5}{4}\right) + |-5|}$. Show your working clearly. [3]
- 6 It is given that $s = ut + \frac{1}{2}at^2$.
- (i) Find s when $u = 2$, $a = 4$ and $t = 5$. [1]
 - (ii) Express a in terms of s , u and t . [2]

- 7 (a) Priyah deposited a sum of money in a bank that offers her an interest at 2% per annum compounded quarterly. She received an interest of \$814.14 at the end of 2 years. Find the sum of money that she deposited in the bank, giving your answer correct to the nearest dollar. [3]

$$[\text{Total amount} = P \left(1 + \frac{r}{100} \right)^n]$$

- (b) Alice spends £684 on her credit card when she is in London. A credit fee of 1.2% will be charged on overseas spending. The credit card company uses an exchange rate between Singapore dollars (\$) and pounds (£) of \$1 = £0.53. Calculate the total cost in Singapore dollars that Alice has to pay the credit card company. Give your answer correct to the nearest cent. [3]

- 8 The figure below consists of a pentagon and a triangle.

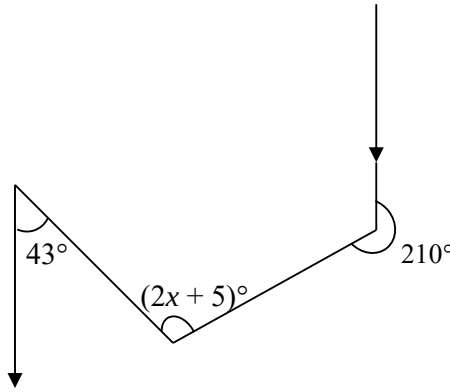


- (i) Calculate the sum of the interior angles of a pentagon. [2]
- (ii) Hence, calculate the sum of the angles a, b, c, d, e, f, g and h in the diagram. Show your working clearly. [2]
- 9 (a) If $6x - 2y = 4x + 5y$ and $x \neq 0$, find the value of $\frac{y}{x}$. [2]
- (b) 12 men can paint 4 panels in 6 hours. How many men are needed if 5 panels are to be painted in 15 hours? [3]

[Turn Over]

- 10** An aeroplane flies a distance of 10841 km from Singapore to London.
The average speed of the aeroplane is 780 km/h.
- (i) Calculate the flight time, in hours and minutes. [2]
- Singapore is 7 hours ahead of London. The aeroplane departed Singapore on Sunday at 0900 Singapore time.
- (ii) What is the local arrival time in London? [2]
- 11** A group of scouts used a map with a scale of 1 : 25000 for a hike.
- (i) The actual length of a road was known to be 3.2 km.
Calculate the length of this road on the map in cm. [1]
- (ii) An open rectangular field measuring 4.4 cm by 2.92 cm was found on this map. Calculate the actual area of the field in m². [2]
- 12** (a) A shop makes a loss of 2% when it sold a fridge at \$668. Calculate the original cost of the fridge when the shop bought it. [2]
- (b) The shop offers 20% discounts to customers who pay \$20 to become its member. Jason wants to purchase a TV set which costs \$699. How much lesser does Jason pay in total if he joins as a member and buys the TV set? [2]
- 13** A five-star hotel offers a promotional price for a stay of 3 nights as follows.
- | | |
|--|--|
| Premier King Room – Price for 2 adults | Deluxe King Room – Price for 2 adults |
| 1 extra-large double bed | 1 extra-large double bed |
| Room size: 33 m ² | Room size: 33 m ² |
| Breakfast included in the room rate | Breakfast available, pay at the restaurant |
| S\$948.55 (inclusive of 10% service charge followed by 7% GST) | S\$780.42 (not inclusive of 10% service charge and 7% GST) |
- (i) How much, including service charge and GST, will a couple pay if they choose the Deluxe King Room? [3]
- (ii) Which room will be cheaper to stay? Explain your choice. [1]

- 14 (a) The diagram below is not drawn to scale. Calculate the value of x . [3]



- (b) Melissa is drawing a quadrilateral $ABCD$. $\angle B$ is 100° less than $\angle A$.
 $\angle C$ is three times the size of $\angle B$. $\angle D$ is 20° more than $\angle B$.
 Let $\angle B = x^\circ$.
- (i) Form an equation in x and solve it to find the angles of the quadrilateral. [3]
- (ii) What is the name of this quadrilateral? [1]

- 15 (a) The first three terms in a sequence of numbers, $T_1, T_2, T_3, \dots$, are given below.

$$T_1 = 1^2 + 1 = 2$$

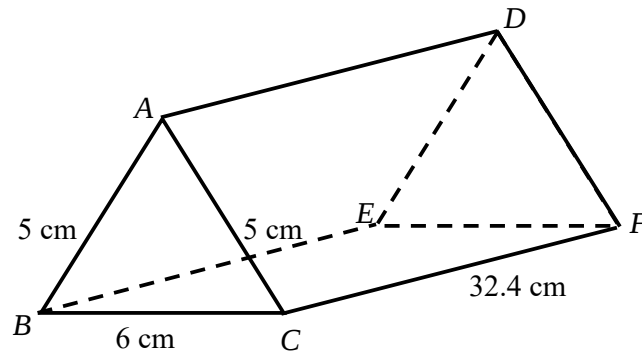
$$T_2 = 2^2 + 2 = 6$$

$$T_3 = 3^2 + 3 = 12$$

- (i) Find an expression, in terms of n , for T_n . [1]
- (ii) Evaluate T_{20} . [1]
- (iii) Find n if $T_n = 992$. [1]
- (iv) Explain why 125 cannot be a number in the sequence. [1]
- (b) The first four terms in another sequence are 100, 94, 88, 82.
 Write down an expression, in terms of n , for the n th term of this sequence. [1]

[Turn Over]

- 16 A chocolate bar is in the shape of a triangular prism, with each end being an isosceles triangle.



- (i) Given that $AB = AC = DE = DF = 5$ cm and $BC = EF = 6$ cm, using Pythagoras' Theorem, show that the height of the chocolate bar is 4 cm. [2]
- (ii) Given that the length of the chocolate bar is 32.4 cm, calculate its volume. [2]
- (iii) Find the total surface area of the chocolate bar. [3]

- 17 **Answer the whole of this question on a blank piece of A4 paper.**

A triangular garden PQR has side lengths $PQ = 6$ cm, $QR = 10$ cm and $PR = 9$ cm.

- (i) Construct the triangular garden PQR . [2]
- (ii) Construct the angle bisectors of $\angle PQR$ and $\angle QPR$.
Label the intersection point S . [2]
- (iii) Construct a line that is perpendicular to QR and passes through S . The line intersects QR at a point. Label this point T .
Measure the length of ST . [2]
- (iv) A circular pond is to be built in the garden such that it touches all the sides of the triangular garden. Draw the circle. [1]

End of Paper