

Name: _____ () Class: _____



華僑中學

HWA CHONG INSTITUTION

Practice Paper A

INTEGRATED 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.

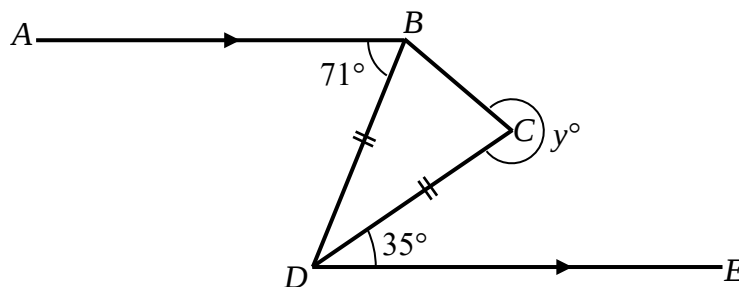
You are expected to use an electronic calculator to evaluate explicit numerical expressions. The use of a graphing calculator is not permitted.

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

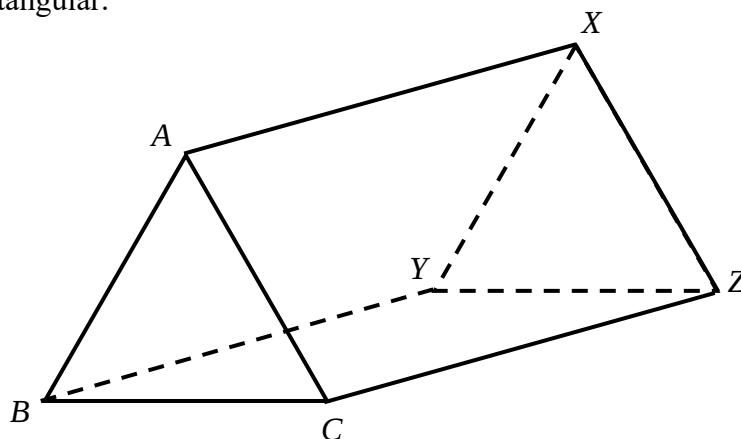
This question paper consists 5 printed pages, including this page.

- 1 (a) Express 9261 as its prime factors. Hence, find $\sqrt[3]{9261}$ without the use of a calculator. [3]
- (b) Given that 9261 and a number N has an LCM of 37044 and a HCF of 9, Find the smallest N . [3]
- 2 (a) Without the use of the calculator, estimate $\sqrt{\frac{9.03 \times 7.99}{3.998 \times 2.02}}$ correct to 1 significant figure. [2]
- (b) Show how you would arrange the following in descending order:
 $0.\dot{1}\dot{7}$, $0.1\dot{7}$, 0.18 , $\frac{1}{7}$, $0.1\dot{7}8\dot{7}$ [3]
- 3 (a) Given that $\frac{1}{3}x \leq 8\frac{1}{5}$, find the greatest possible value of x if x is a rational number. [2]
- (b) If m and n are positive integers less than or equal to 22 such that $\frac{13}{16} < \frac{m}{n} < \frac{14}{17}$, find the possible values of m and n where $\frac{m}{n}$ is recurring. [2]
- 4 Given that $P = \frac{QR}{3Q - 7}$,
- (a) calculate the value of P when $R = 20$ and $Q = -11$, [2]
- (b) express Q in terms of P and R . [3]
- 5 Evaluate without the use of a calculator, $\sqrt[3]{\left(-\frac{8}{5}\right)^2 - 4\frac{4}{25} \div 5} + \sqrt{\pi - 3.102}$. [3]
- 6 Solve the equation $\frac{3}{4}x - \frac{1}{6}(x + 2) = \frac{2}{3}(3x + 4)$. [3]
- 7 To earn extra money, Fanny works temporarily at Burger Queen's Fast Food Restaurant. In a particular week during the school holidays, she worked twice as many hours on Tuesday as she did on Monday but $\frac{7}{8}$ of the hours on Wednesday compared to Monday.
- (a) If Fanny worked x hours on Monday, write down an expression each for the number of hours she worked on Tuesday and on Wednesday. [2]
- (b) For these three days she received \$139.50. If she is paid \$4.50 per hour, how many hours did Fanny work on Monday? [3]

- 8 (a) A n -sided polygon has 4 interior angles measuring 120° each.
The remaining interior angles all measure p° each.
Find an expression for p , in terms of n . [3]
- (b) In the figure below, AB is parallel to DE and $BD = CD$. Given that $\angle ABD = 71^\circ$ and $\angle CDE = 35^\circ$, find the reflex angle BCD denoted by y° . [3]



- 9 The solid triangular prism, shown in the diagram, stands on a horizontal rectangular base $BCZY$. The triangles ABC and XYZ are vertical planes and the faces $ABYX$ and $ACZX$ are rectangular.



- (a) (i) Given that $AB = AC = 17$ cm and $BC = 16$ cm, show using Pythagoras' Theorem that the height of A above the base is 15 cm. [3]
- (ii) If CZ is 28 cm, calculate the volume of the prism. [2]
- (b) If the prism with dimensions in (a) is to be sent as a gift and posted overseas, find the total surface area of the prism required to be wrapped and calculate its mass if the density is 0.97g/cm^3 . [4]

10 (Not examinable in 2020)**Answer the whole of this question on a sheet of graph paper.**

Two mobile companies in Mexico, *S1* and *S2*, offer plans with talk time rates as shown in the following tables.

S1:

Charges (\$)	0	1	2	3	4
Time (min)	10	22	35	47	60

S2:

Charges (\$)	0	1	2	3	4	5
Time (min)	20	28	36	44	52	60

- (a) Using a scale of 2 cm to represent 10 units on the horizontal axis and 4 cm to represent 1 unit on the vertical axis, plot the graphs of Charges (\$) against Time (min) for the two companies. [4]

- (b) If Porky wants to pay only \$7 for a talk time plan per month, which company should he choose? Explain your answer. [2]

11 Answer the whole of this question on a sheet of plain paper.

Construct a quadrilateral $ABCD$ such that $AB = 6$ cm, $BC = 4.5$ cm, $CD = 13$ cm, $\angle ABC = 112^\circ$ and $\angle BCD = 95^\circ$. Construct a perpendicular bisector of AB and name the intersection point with AB , M and the intersection point with CD , N . Measure and write down the size of $\angle MNC$. [4]

- 12** Xiao Ming borrowed \$50 000 from OCBD bank at a simple interest rate of 14% per annum. He also borrowed \$50 000 from UOC bank at 10% compounded half-yearly. He will return \$73 205 to OCBD bank and UOC bank after p years and q years respectively.

- (a) Find the value of q . [3]
 (b) Are the values of p and q the same? If not, explain why there is a difference. [2]

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

13 (Not examinable in 2020)

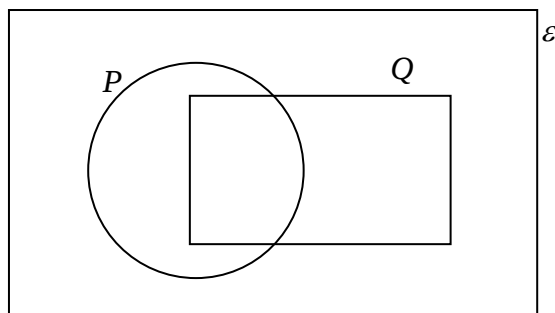
Find the equation of the line parallel to $7x + 5y = 49$ and passing through the point (10, 2).

[3]

14 (Not examinable in 2020)

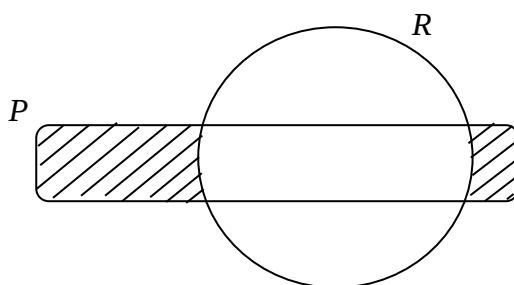
- (a) Copy the Venn diagram below and shade $P \cap (P \cap Q)'$.

[2]



- (b) Express in set notation (as simply as possible), the shaded region in the Venn diagram below.

[2]



- (c) Given $A \subset B$ and $B \cap C = \emptyset$.
- (i) Illustrate the above information with a Venn Diagram. [1]
- (ii) If $n(\epsilon) = 42$, $n(A) = 15$ and $n(C) = 23$, what are the possible values of $n(B)$? [2]

15 (Not examinable in 2020)

- (a) The prices, in Pounds, of Logo sets in a shop are given in the table below:

Price (£)	6	7	8	9	10	11	12
Frequency	11	14	x	28	12	13	18

- (i) State the greatest possible value of x if the mode is 9. [1]
- (ii) Given that $x = 18$, construct a bar graph for the distribution. [2]
- (b) If the total number of Logo sets in the shop is 142, find
- (i) the value of x , [2]
- (ii) the median price, [2]
- (iii) the mean price. [2]

End of Paper

Paper A Sec 1 Mainstream Answer Key

1 (a) $3^3 \times 7^3$; $3 \times 7 = 21$

(b) $N = 36$

2 (a) 3

(b) $0.18, 0.\dot{1}78\dot{7}, 0.\dot{1}7, 0.\dot{1}\dot{7}, \frac{1}{7}$

3 (a) $x = \frac{123}{5}$ or $24\frac{3}{5}$

(b) $m = 9, n = 11$ or $m = 18, n = 22$

4 (a) $P = \frac{11}{2}$ or $5\frac{1}{2}$

(b) $Q = \frac{7P}{3P - R}$

5 1.4

6 $-\frac{36}{17}$ or $-2\frac{2}{17}$

7 (a) $2x$ and $\frac{7}{8}x$

(b) $x = 8$

8 (a) $p = \frac{180n - 840}{n - 4}$

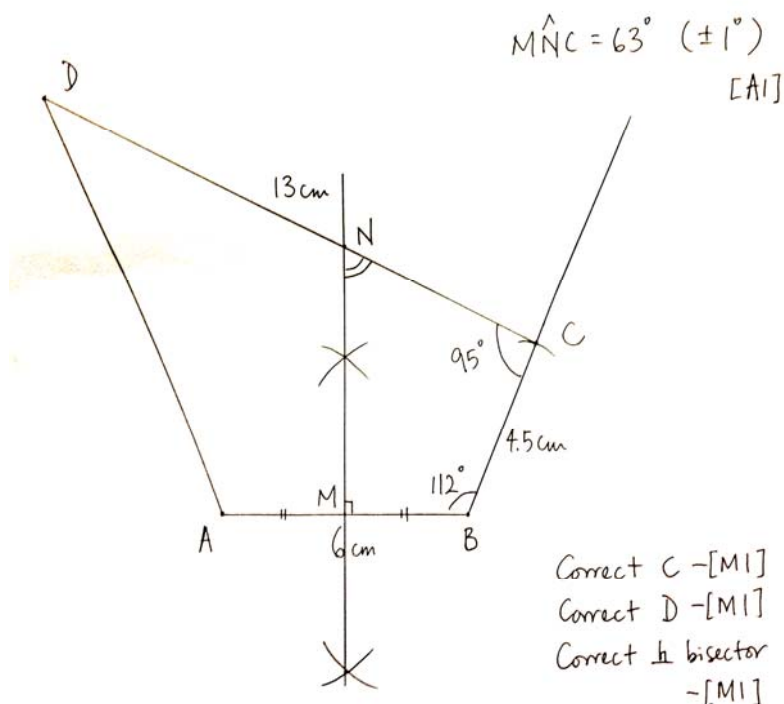
(b) 288°

9 (a) (i) 15 cm

(ii) 3360 cm^3

(b) 3259.2 g or 3.2592 kg

11



12 (a) $q = 2$ or 4

(b) $p = 3.315$. Thus p and q are not the same.

Because compound interest usually takes a shorter time to accumulate more amount than simple interest or Because both r and T are different.