Name: _____ ( ) Class: _____

華僑中學
HWA CHONG INSTITUTION
Practice Paper C

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 6 printed pages, including this page.

1 **(a)** From the following set of numbers

$$\sqrt[3]{-65},\quad -3.14,\quad \pi,\quad 0.\dot{7}\dot{9},\quad \frac{22}{7},\quad (-3)^2,\quad 2\sqrt{2}\times\sqrt{2},$$

write down the rational numbers. [2]

(b) Arrange the numbers $0.2\dot{3}$, 0.231, $\frac{2}{9}$, 0.23 and $0.\dot{2}\dot{3}$ in descending order. [2]

2 **(a)** Express 150 and 925 as products of their prime factors, giving your answers in index notation. [2]

(b) Find the smallest integer n, such that $150n$ is a multiple of 925. [2]

(c) The HCF and LCM of 270 and z are 18 and 5940 respectively.

Find the value of z. [2]

3 **(a)** Evaluate, without using a calculator,

$$\sqrt[3]{\left(-\frac{4}{3}\right)^2\times\left\{\left[\frac{19}{24}+\left(-\frac{5}{8}\right)\right]\div\left(-\frac{1}{6}\right)^3\right\}}.$$ [3]

(b) **(Not examinable in 2020)**

Simplify, leaving your answer in prime base,

$$\left(\frac{3}{2}\right)^{2013}\times\left(6^2\right)^{1006}.$$ [3]

4 **(i)** Estimate 304.279 and 595.124 to 1 significant figure. [2]

(ii) Hence estimate the value of $\dfrac{(304.279)^2}{595.124}$. [1]

(iii) Would your answer in (ii) be different if you have estimated 304.279 and 595.124 to 2 significant figures instead? Give a reason for your answer. [1]

4 **(Not examinable in 2020)**

If $x = 9.5\times10^{-123}$ and $y = 5\times10^{-124}$, evaluate the following without using a calculator, expressing your answers in standard form

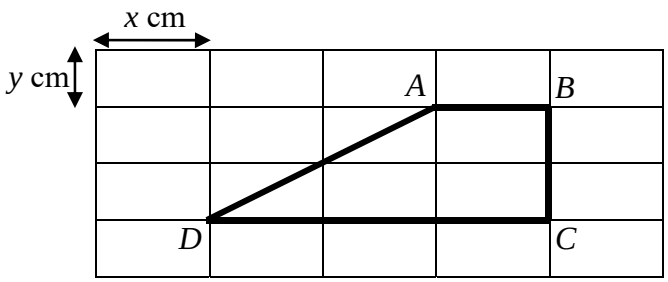
(a) $6xy$, [2]

(b) $3y + 2x$. [2]

6 **(a)** If $w = \dfrac{x - y + z}{xyz}$, make z the subject of the formula. [2]

(b) The diagram below is made up of rectangles each of length x cm and width y cm.

What is the area of the region not enclosed by $ABCD$? [2]



7 Simplify

(a) $\dfrac{3g + 4h}{8} - 2(g + h)$, [2]

(b) $(6 - b)(-a) - \left[(a + 1) - (6ab - 5a + 1)\right]$. [3]

8 **(Not examinable in 2020)**

Simplify, giving your answers in positive indices

(a) $\dfrac{6a^3b^2 \times 9a}{(-3ab)^3}$, [2]

(b) $\dfrac{m^5 \times m^9 \div m^{11}}{m^6 \times (m^2 \div m^8)}$. [2]

9 Solve the equations.

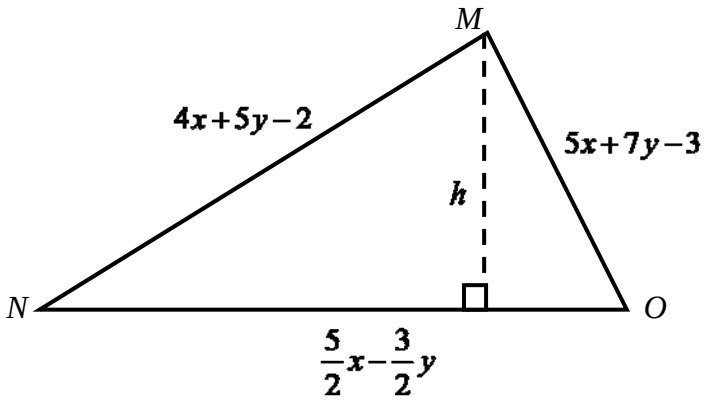
(a) $0.75\ (8x - 5) = x$, [2]

(b) $9x^3 = \dfrac{1}{3}$, [2]

(c) $\dfrac{8}{x - 9} = \dfrac{10}{2x + 3}$. [3]

You decide!! Work hard to achieve your target grade!!

10 ΔMNO has sides $(4x + 5y - 2)$ cm, $(5x + 7y - 3)$ cm and $\left(\frac{5}{2}x - \frac{3}{2}y\right)$ cm as shown in the diagram below. The perpendicular distance from M to NO is h cm.



(a) Find the perimeter of ΔMNO in terms of x and y. [2]

(b) Given that $h = 2\frac{2}{5}x$, find the area of ΔMNO in terms of x and y. [2]

(c) Given that $x = 5$ and $y = -1$, find the perimeter and area of ΔMNO. [2]

11 Solve $\frac{4}{5}(x-10) > \frac{1}{3}(2-x)$ and illustrate your answer with a number line. [3]

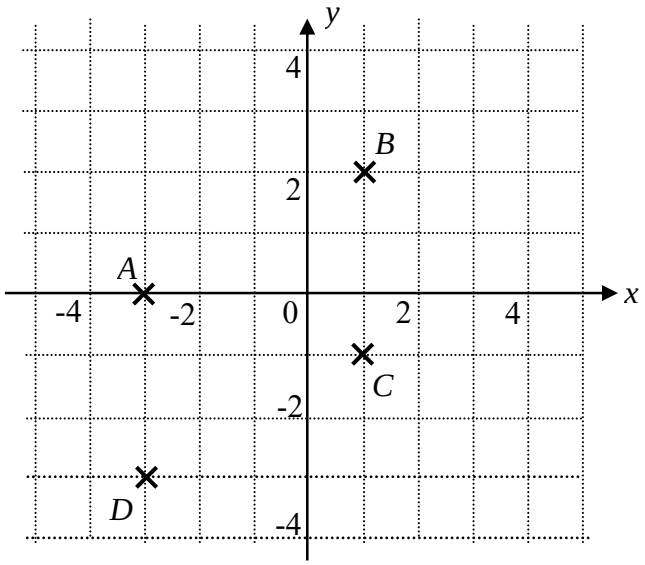
12 Given $3 < a \leq 9$ and $-6 \leq b < 4$, where a and b are integers, find

(a) the smallest possible value of $\frac{2a}{b}$, [1]

(b) the largest possible value of $a^2 - b^2$. [1]

13 **(Not examinable in 2020)**

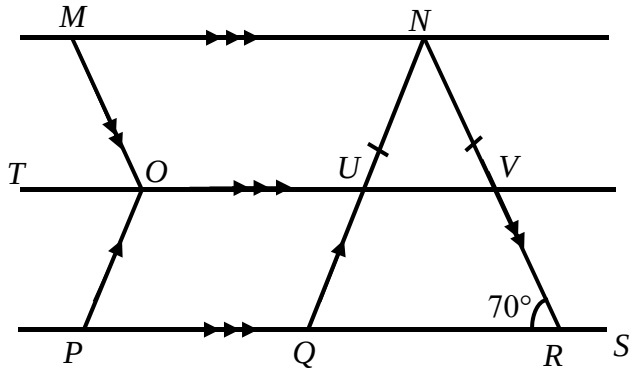
(i) For the diagram below, write down the coordinates of C and D. [1]



(ii) Calculate the length of AB. [1]

(iii) Write down the name of the polygon formed when you joined A, B, C, D, A. [1]

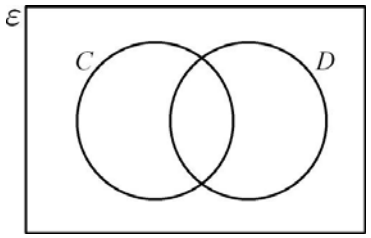
14 In the diagram, NQR is an isosceles triangle with $NQ = NR$ and $\angle NRQ = 70°$. Given also that MN is parallel to both PQR and $TOUV$ and OP is parallel to NQ, calculate reflex $\angle MOP$. [3]



15 A polygon has two interior angles each of size 165°, three interior angles each of size 140° and the remaining interior angles are each of size 150°.
Find the number of sides of the polygon. [3]

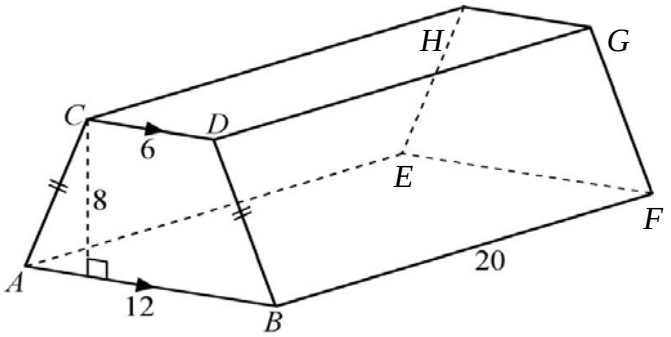
16 **(Not examinable in 2020)**

(a) Copy the Venn diagram below and shade $(C \cap D)'$. [2]



(b) Suppose $\varepsilon = \{x : 1 \leq x < 20, x \text{ is a positive integer}\}$, $A = \{x : x \text{ is a multiple of } 3\}$ and $B = \{x : x \text{ is divisible by } 4\}$. List all the elements of $A' \cap B'$. [2]

17 The diagram below shows a wooden block. AB is parallel to CD, the length and height of the block is 20 cm and 8 cm respectively. The length of AC is equal to the length of BD.

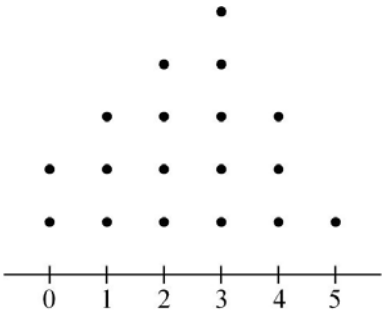


(a) Find the volume of the wooden block in cm^3. [2]

(b) If the total surface area of the block is 1044 cm^2, find the length of AC. [3]

18 (Not examinable in 2020)

The dot diagram shows the number of storybooks owned by a group of students.



Number of story books

Find

(i) the modal number of storybooks owned, [1]

(ii) the median number of storybooks owned. [2]

19 (Not examinable in 2020)

The test marks of 24 students are shown in the stem and leaf diagram shown below.

Stem	Leaf
4	5 7 8
5	5 5 6
6	2 2 3 3 3 4 5 5 7 8
7	1 2 6 7 8
8	0 2 8

Key: 4 | 5 means 45 marks.

(a) The minimum mark for a distinction is 75 marks. What percentage of the students score a distinction? [2]

(b) If the test mark of one more student is included, the mean mark of the 25 students will be 66. Did this student score a distinction? Show your workings clearly. [2]

End of Paper

Practice Paper C Sec 1 Math Answer Key

1 (a) $-3.14,\quad 0.\dot{7}\dot{9},\quad \frac{22}{7},\quad (-3)^2,\quad 2\sqrt{2}\times\sqrt{2}$ **(b)** $0.2\dot{3}, 0.\dot{2}\dot{3}, 0.231, 0.23, \frac{2}{9}$

2 (a) $150 = 2\times 3\times 5^2,\ 925 = 5^2\times 37$ **(b)** $n = 37$ **(c)** $z = 396$

3 (a) -4 **(b)** $\frac{3^{4025}}{2}$

4 (i) 300; 600 **(ii)** 150

(iii) No. Answer is the same when rounded off to 2 significant figures.

5 (a) and (b) **Question on Standard Form**

6 (a) $z = \frac{x-y}{wxy-1}$ or $\frac{y-x}{1-wxy}$ **(b)** $16xy\ \text{cm}^2$

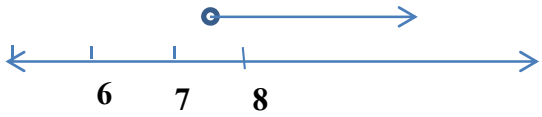
7 (a) $\frac{-13g-12h}{8}$ **(b)** $-12a+7ab$

8 (a) and (b) **Question on Indices** **teach you in Sec 2!**

9 (a) $x = 0.75$ or $\frac{3}{4}$ **(b)** $x = \frac{1}{3}$ **(c)** $x = -19$

10 (a) $(11.5x+10.5y-5)\,\text{cm}$ **(b)** $(3x^2-\frac{9}{5}xy)\ \text{cm}^2$ **(c)** $84\ \text{cm}^2$

11 $x > 7\frac{11}{17}$ or $x > 7.65$ (3s.f)



12 (a) -18 **(b)** 81

13 **Question on Coordinate Geometry**

14 reflex$\angle MOP = 220°$

15 12 sides **teach you Cdt Geometry and Sets in Sec 2!**

16 **Question on Sets**

17 (a) $1440\ \text{cm}^3$ ***(b)** $AC = 13.5$ cm or $AC = 8.54$ cm (to 3 s.f.)

18 (i) 3 books **(ii)** 2.5 books.

19 (a) 25% **(b)** **Yes.** His score is 78.