Year 9 Mathematics
Module 1 Test

Student Name:

Time allowed: 55 minutes

READ THESE INSTRUCTIONS FIRST

Write in dark blue or black pen.
You may use a soft pencil for any diagrams or graphs.
Answer **all** the questions.
Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question.
The use of an electronic calculator is expected, where appropriate.
You are reminded of the need for clear presentation in your answers.
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 44 (20).

Question 1

A ferry to Crete leaves at 0730.
The journey takes 2 hours and 48 minutes.
Work out the time when the ferry arrives in Crete.

Answer 10 18 [1]

Question 2

Write the following numbers in order starting with the smallest.

$\frac{2}{7}$ 0.283 28%

0.286 0.28

Answer 28% < 0.283 < 2/7 [1]

Question 3

Insert one pair of brackets to make the following equation correct.

$2 \times 8 - 5 - 4 = 15$

[1]

Question 4

Write down the value of

(a) 10^{-2},

Answer(a) 0.01 [1]

(b) 4^{0},

Answer(b) 1 [1]

(c) $\sqrt[3]{343}$.

Answer(c) 7 [1]

Question 5

$$\frac{9.6 \times 7.8 - 0.53 \times 86}{4.95}$$

(a) **(i)** Rewrite this calculation with each number written correct to 1 significant figure.

Answer(a)(i) $\frac{10 \times 8 - 0.5 \times 90}{5}$ ≈

[1]

(ii) Work out the answer to your calculation in **part(a)(i)**.
Do not use a calculator and show all your working.

$\frac{80 - 45}{5} = \frac{35}{5}$

Answer(a)(ii) 7 [2]

(b) Use your calculator to work out the correct answer to the original calculation.

Answer(b) 5.92 [1]

Question 6

The distance from the Sun to the planet Saturn is 1 429 400 000 kilometres.

Write this distance in standard form, correct to 3 significant figures.

Answer 1.43×10^{9} km [2]

Question 7

$\geqslant$ $<$ $>$ $=$ $\leqslant$

Choose one of the above symbols to make a correct statement in the answer space.

Answer 0.4 ..... $\frac{4}{9}$ [1]

Question 8

A factory makes doors that are each 900 millimetres wide, correct to the nearest millimetre.

Complete the statement about the width, w millimetres, of each door.

Answer ..... $\leqslant w <$ ..... [2]

Question 9

Hakim and Bashira measure their heights.
Hakim's height is 157 cm and Bashira's height is 163 cm, both correct to the nearest centimetre.

Find the greatest possible difference between their heights.

163.5 - 156.5

Answer ..... cm [2]

Question 10

Martin recorded the outside temperature every three hours.
At 07 00 the temperature was – 2°C.

(a) This was 5°C higher than the temperature at 04 00.
Write down the temperature at 04 00.

Answer(a) ..... −7 ..... °C [1]

(b) At 10 00 the temperature was 11°C.
Write down the increase in temperature between 07 00 and 10 00.

Answer(b) ..... 13 ..... °C [1]

Question 11

(a) Find the lowest common multiple of 7 and 9.

Answer(a) ..... 63 ..... [1]

(b) Without using a calculator, work out $\frac{8}{9} \quad \frac{5}{7}$, leaving your answer as a fraction.

You must show all your working.

$$\frac{56-45}{63}$$

$$\frac{11}{63}$$

Answer(b) ..... [2]

Question 12

Work out the value of $3\frac{3}{4} \times 1\frac{1}{7}$.

Show all your working and leave your answer as a fraction.

$\frac{15}{\cancel{4}^{1}} \times \frac{\cancel{8}^{2}}{7} = \frac{30}{7}$

Answer $4\frac{2}{7}$ [2]

Question 13

Dominic, Esther, Flora and Galena shared a pizza.

(a) Dominic ate $\frac{1}{5}$ of the pizza and Esther ate $\frac{2}{7}$ of the pizza.

Show that $\frac{18}{35}$ of the pizza remained.

Do not use your calculator and show all your working.

Answer (a)

$1 - \left(\frac{1}{5} + \frac{2}{7}\right) = \frac{35}{35} - \left(\frac{7+10}{35}\right)$

$= \frac{35-17}{35} = \frac{18}{35}$ [2]

(b) Flora ate $\frac{2}{3}$ of the **pizza that remained.**

Find the fraction of the pizza that was left for Galena.

$\frac{1}{\cancel{3}} \times \frac{\cancel{18}^{6}}{35}$

Answer(b) $6/35$ [2]

or

$\frac{2}{\cancel{3}} \times \frac{\cancel{18}^{6}}{35} = \frac{12}{35}$

$\frac{18}{35} - \frac{12}{35} = \frac{6}{35}$

Question 14

x is an integer between 60 and 90.

Write down the value of x when it is

(a) an odd square number,

Answer(a) $x =$ 81 [1]

(b) 4^3,

Answer(b) $x =$ 64 [1]

(c) a multiple of 29,

Answer(c) $x =$ 87 [1]

(d) a prime factor of 146.

Answer(d) $x =$ 73 [1]

Question 15

4 $\sqrt{8}$ $\sqrt{25}$ $\frac{5}{2}$ 0.3333

From the list above, write down

(a) a prime number,

Answer(a) $\sqrt{25}$ [1]

(b) an irrational number.

Answer(b) $\sqrt{8}$ [1]

Question 16

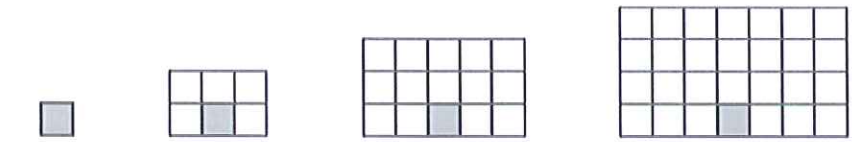


Diagram 1 Diagram 2 Diagram 3 Diagram 4

Look at the sequence of diagrams.

(a) Diagram 2 has a height of 2.

Write down the height of

(i) Diagram 5,

Answer(a)(i) 5 [1]

(ii) Diagram 10,

Answer(a)(ii) 10 [1]

(iii) Diagram *n*.

Answer(a)(iii) n [1]

(b) Diagram 2 has a width of 3.

Find the width of

(i) Diagram 5,

Answer(b)(i) 9 [1]

(ii) Diagram 10,

Answer(b)(ii) 19 [1]

(iii) Diagram *n*.

Answer(b)(iii) $2n-1$ [2]

(c) There are 6 squares in Diagram 2 and 15 squares in Diagram 3.

(i) Write down how many squares there are in Diagram 5.

Answer(c)(i) 45 [1]

(ii) Explain how this is found from the height and width of the diagram.

Answer(c)(ii) Multiply them [1]

(iii) Write down, in terms of *n*, how many squares there are in Diagram *n*.

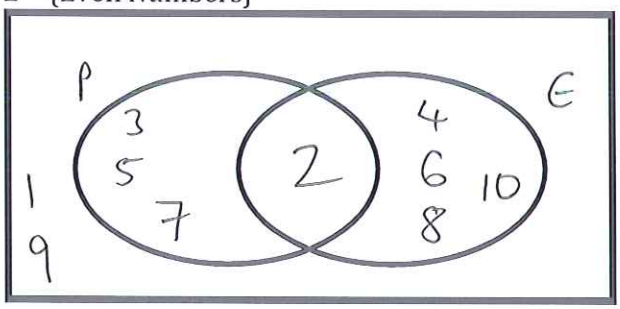
Answer(c)(iii) $n(2n-1)$ [1]

or $2n^2-n$

EXTENSION

Question 1

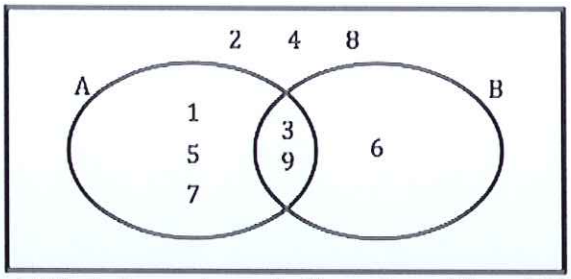
Fill in the Venn Diagram below to illustrate the following information:
The Universal Set is the whole numbers from 1 to 10 (including 1 and 10)
P = {Prime Numbers}
E = {Even Numbers}



[4]

Question 2

Look at the Venn Diagram below and answer the following questions:



a) What elements are in the union of A and B?

{1, 3, 5, 6, 7, 9}

b) What is n(A) equal to?

n(A) = 5

c) List the elements in A'.

A' = {2, 4, 6, 8}

[3]

Question 3

Write the next 2 terms for the following sequence:

5, 7, 11, 17, 25, ...

The next 2 terms in the sequence are 35 and 47

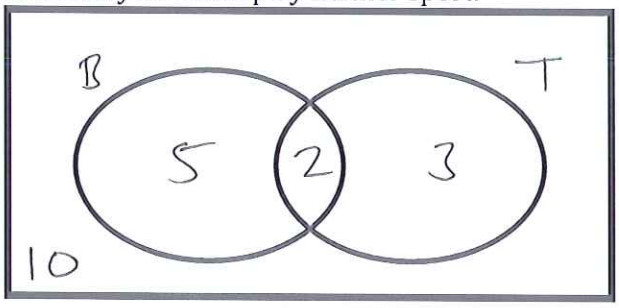
[2]

Question 4

In a tutor group of 20 students:

- 7 students play basketball,
- 5 students play touch rugby,
- 2 students play both sports.

Represent this information in a Venn Diagram below, and use your diagram to work out how many students play neither sport.



10 students play neither sport.

[3]

Question 5

If a = 3.5 to 1 decimal place and b = 7 to the nearest whole number:

a) What is the ***greatest*** possible value for $a + b$?

$3.55 + 7.5$

11.05

b) What is the ***least*** possible value for $\frac{b}{a}$?

$\frac{6.5}{3.55}$

1.83

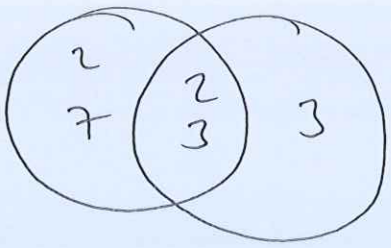
[4]

Question 6

Find the Highest Common Factor and the Lowest Common Multiple for 84 and 18.

$84 = 2^2 \times 3 \times 7$

$18 = 3^2 \times 2 \times 3^2$



HCF (84, 180) = 6

LCM (84, 180) = 252

[4]

END OF QUESTIONS