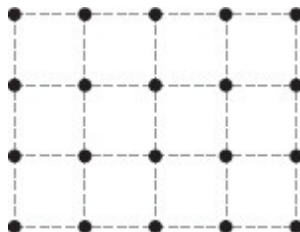


Non-Calculator

Q1.

A 4×3 grid has 20 dots as shown.



- (a) How many dots does an 8×6 grid have?

Answer -----

(1)

- (b) How many dots does a $4 \times y$ grid have?

Answer -----

(1)

- (c) How many dots does an $x \times y$ grid have?

Answer -----

(1)

- (d) How many dots does a $2x \times y$ grid have?

Answer -----

(1)

(Total 4 marks)

Calculator

Q2.

Mersenne primes are prime numbers that can be written in the form

$$2n - 1 \text{ where } n \text{ is a whole number.}$$

For example, 3 can be written as $2^2 - 1$

(a) Prove that $2^9 - 1$ is not a Mersenne prime.

(2)

(b) There are Mersenne primes when $n = 5$ and when $n = 7$

Ama says,

“The ratio of the indices is 5 : 7

This means the ratio of the Mersenne primes is 5 : $7n$

Show that Ama is wrong.

(1)

(Total 3 marks)

Q3.

A menu has a choice of 3 starters, 5 main courses and 4 desserts.

How many different choices of a 3-course meal are possible?

Circle your answer.

12

23

60

972

(Total 1 mark)

Q4.

Tom picks a three-digit even number
The first digit is greater than 6
The second digit is less than 7

How many different numbers could he pick?

Answer _____

(Total 3 marks)

Q5.

Lucy makes 5-digit numbers using all of these cards.



How many different numbers greater than 50 000 can she make?

Answer _____

(Total 3 marks)

Q6.

Ann picks a 4-digit number.

The first digit is not zero.

The 4-digit number is a multiple of 5

How many different 4-digit numbers could she pick?

Answer _____

(Total 3 marks)