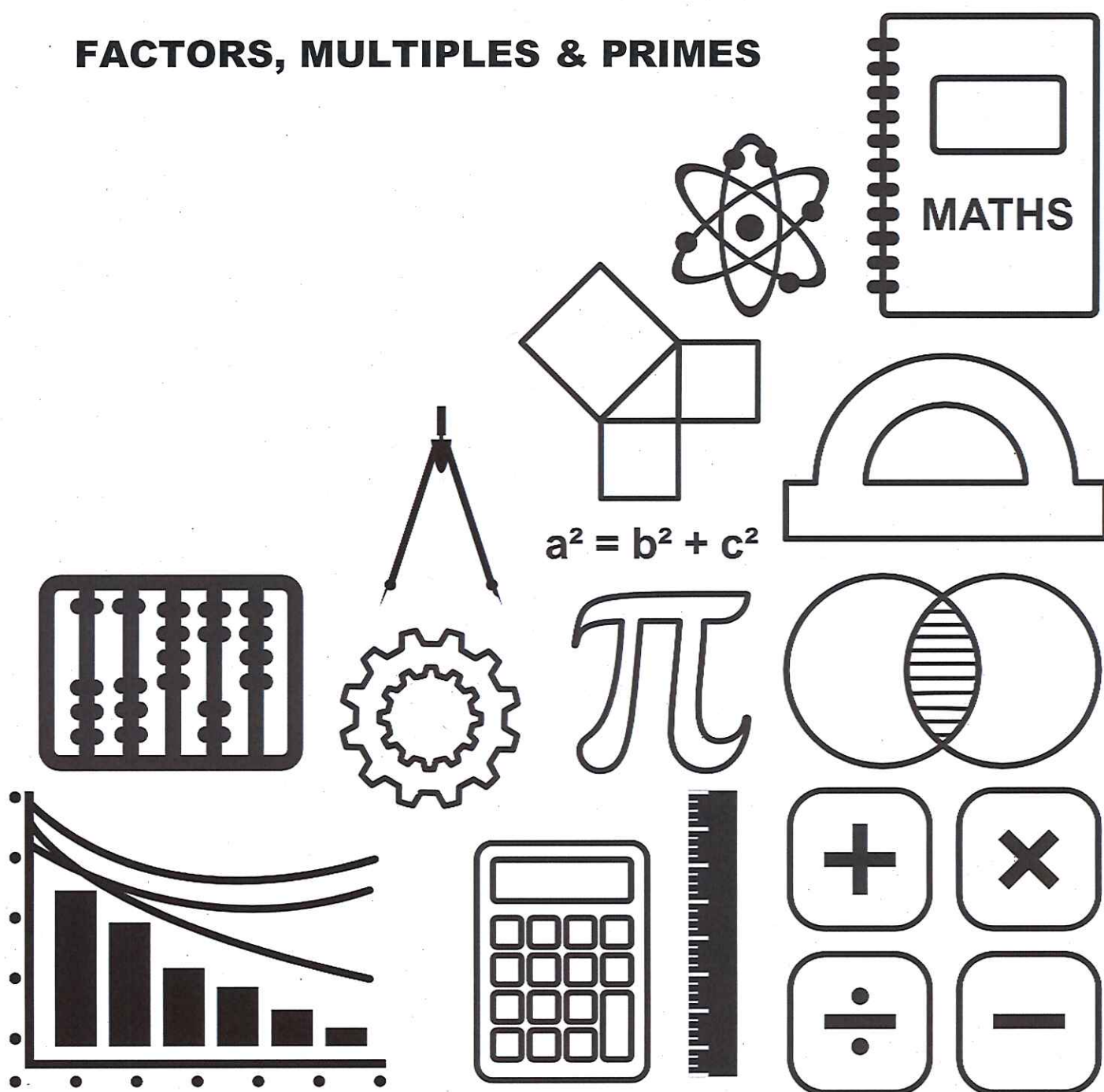


GCSE TOPIC BOOKLET

SOLUTIONS

FACTORS, MULTIPLES & PRIMES



1. Choose a number from the table to match each statement. You must give a reason for each answer.

25	6	8	20
7	10	1000	24

- a) A factor of 12: 6
Reason: Because $6 \times 2 = 12$
- b) A prime number: 7
Reason: Because 7 only has 2 factors
1 and itself
- c) A multiple of 100: 1000
Reason: Because $100 \times 10 = 1000$

(6)

2. Using only the numbers in the following list,

33 42 63 19 8 36 18 54.

Write down

- a) a factor of 84 42
- b) a multiple of 12 36
- c) a prime number 19

3. Write down two factors of 22

1 and 22 (also 11 and 2)
any of these.

(3)

(1)

4. Draw a circle around the **prime number** in the following list.

12 15 49 19 27 9

(1)

5. Using only the numbers in the following list,

2 5 9 12 17 18 32 38 42

Write down

- a) the factors of 24

2, 12

- b) the multiples of 3

9, 12, 18, 42

- c) the prime numbers

2, 5, 17

(3)

6. "All prime numbers have more than two factors." Is this statement true or false?

You must give a reason for your answer.

False - All prime numbers have exactly two factors, 1 and the number itself.

(2)

7. "All square numbers have an odd number of factors." Is this statement true or false?

You must give a reason for your answer.

True - The square root is a factor twice itself (so just one number), and the other factors are in pairs. This will always give an odd number of factors.

(2)

8. Write down all the factors of 45.

1, 3, 5, 9, 15, 45

(1)

9. Write down all the prime numbers between 70 and 80.

71, 73, 79

(1)

10. Write down all the multiples of 7 between 30 and 60.

35, 42, 49, 56

(1)

11. Anwen's phone number has 6 digits. Anwen remembers her phone number as three lots of two digit numbers.

The first 2-digit number is a prime number between 20 and 25. 23

The second 2-digit number is a square number between 50 and 70. 64

The third 2-digit number is a factor of 30 that is divisible by 3.

All 6 digits of Anwen's number are different.

What is Anwen's phone number?

Factors of 30 are 1, 2, 3, 5, 6, 10, 15, 30

Numbers divisible by three are 3, 6, 9, 12, 15, 18, 21, 24, 27, 30. Must be 2 digits, and all 6 digits different. Therefore 15.

Anwen's phone number is

2 3 6 4 1 5

(4)

12. Jack thinks of a number. It is a multiple of 7 that is smaller than 50. His number is also bigger than the square of 6 and it is **not** a square number.

What is Jack's number?

multiples of 7 < 50 $\Rightarrow$ 7, 14, 21, 28, 35, 42, 49

$6^2 = 36 \Rightarrow$ 42 or 49

Not a square number

42

(2)

13. Given the following information, complete the Venn diagram shown below.

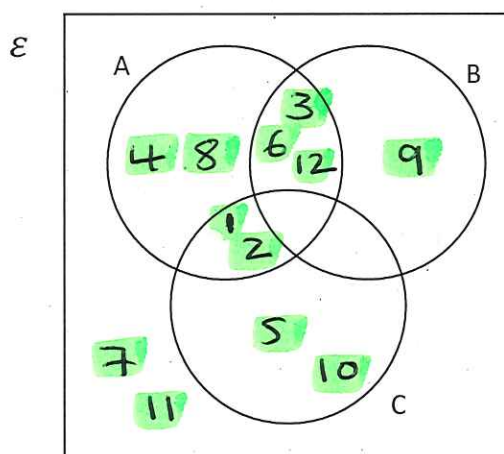
- $\varepsilon = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
- A is the set of factors of 24 1, 2, 3, 4, 6, 8, 12
- B is the set of multiples of 3 3, 6, 9, 12
- C is the set of common factors of 30 and 70 1, 2, 5, 10

.....

.....

.....

.....



(4)

14. Mair thinks of a number. It is a multiple of 7 and a multiple of 5. Mair's number is even. What is the smallest number that she could be thinking of?

7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75

70

(2)

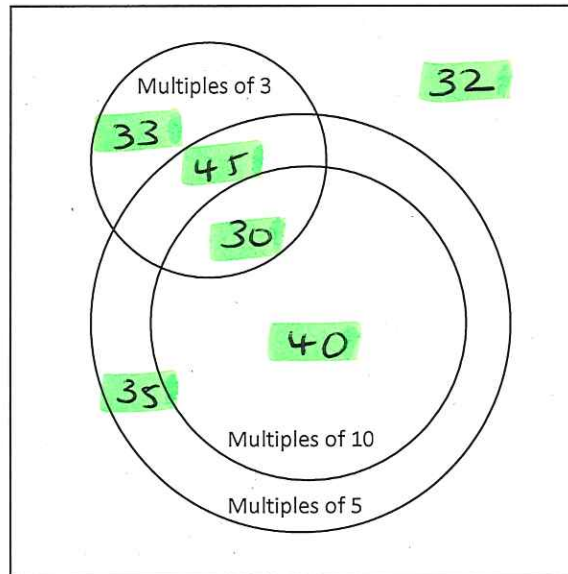
15. A Venn diagram is shown below. Explain why the circle to represent multiples of 10 is drawn inside the circles to represent the multiples of 5?

All multiples of 10 are also multiples of 5.

Or, the multiples of 10 is a subset of the multiples of 5.

(1)

ε



- b) Place each of the six numbers 30, 32, 33, 35, 40, 45 in the correct position in the Venn diagram.

(3)

- c) A number is selected at random from the set $\{30, 32, 33, 35, 40, 45\}$.

Find the probability that the number selected is

- A prime number 0 (no prime numbers)
- A multiple of 10 that is also a multiple of 3 $\frac{1}{6}$ (just 30)
- Neither a multiple of 3 nor 10 $\frac{2}{6}$ ($\frac{1}{3}$) (just 32 & 35)

(3)