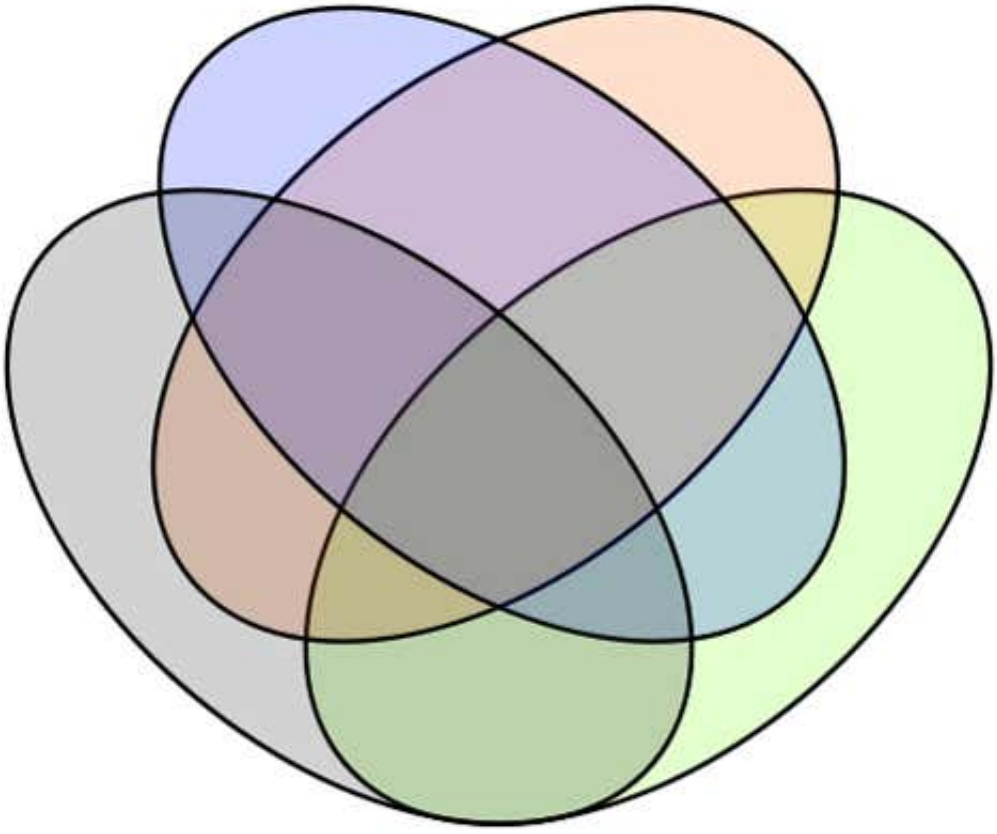
SET THEORY I



Venn Diagram for four sets

Lesson 1

GCSE Mathematics

Set Theory I

1.1 Introduction : What is a Set ?

At a simple level, a set can be thought of as a collection of objects.
The objects are often, but not always, numbers.
If it is helpful, a set can be given a name.
Here are two descriptions of the set that I've called *F*.

F = { The factors of 14 }

F = { 1, 2, 7, 14 }

Notice the use of curly set brackets, { }, rather than curved, ( ).

1.2 Two Ways of Describing a Set

Think of another way of describing each of the following sets.

(i) T = { Traffic light colours }

[1 mark]

(ii) S = { spring, summer, autumn, winter }

[1 mark]

(iii) P = { Mars, Earth, Saturn, ... }

[1 mark]

What does the dot, dot, dot indicate ?

[1 mark]

(iv) M = { Types of metal }

[1 mark]

Teaching Video : http://www.NumberWonder.co.uk/v9003/1.mp4

Watch the Teaching Video and complete the above questions.

1.3 Exercise

Marks Available : 20 + 1 Bonus

Question 1
In the spirit of the introduction, give an alternative description of each of the following sets;

(i) S = { Days of the week with the letter “s” is their spelling }

[1 mark]

(ii) V = { a, e, i, o, u }

[1 mark]

(iii) F = { The factors of 24 } HINT : There are eight

[1 mark]

(iv) A = { **+, –, ×, ÷ }**

[1 mark]

(v) P = { The prime numbers less than 20} HINT : 1 is NOT prime

[1 mark]

(vi) C = { Values of copper coloured British coins in everyday use }

[1 mark]

(vii) $G = \{ \alpha, \beta, \chi, \delta, \varepsilon, \phi, \gamma, \eta, \iota, \varphi, \kappa, \lambda, \mu, \nu, o, \pi, \theta, \rho, \sigma, \tau, \upsilon, \varpi, \omega, \xi, \psi, \zeta \}$

[1 mark]

(viii) E = { Even prime numbers } HINT : There's only one !

[1 mark]

(ix) P = { 1, 2, 4, 8, 16, 32, 64, 128, ... }

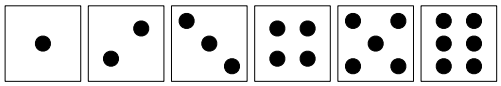
[1 mark]

Notice the dot, dot, dot.
BONUS MARK : What does the ... tell you about this set ?

[BONUS 1 mark]

(x) O = { Odd numbers } HINT : List a few then put ...

[1 mark]

(xi) D = {  }

[1 mark]

(xii) F = { Factors of 17 }

[1 mark]

(xiii) M = { Multiples of 5 that are ***less than*** 60 }

[1 mark]

(xiv) R = { I, V, X, L, C, D, M }

[1 mark]

(xv) R = { red, orange, yellow, green, blue, indigo, violet }

[1 mark]

(xvi) S = { hearts, clubs, spades, diamonds }

[1 mark]

(xvii) M = { makes of mobile phone } HINT : List a few then put ...

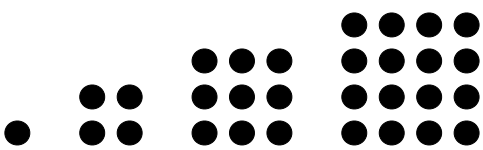
[1 mark]

(xviii) C = { ready salted, cheese & onion, prawn cocktail, ... }

[1 mark]

(xix) S = { square numbers }

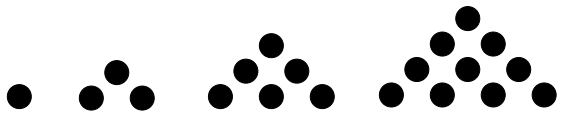
HINT :



[1 mark]

(xx) T = { triangular numbers }

HINT :



[1 mark]