

SETS WORKSHEET

1) List the following sets:

A = {odd numbers less than 16}

B = {capitals of countries in the United Kingdom}

C = {numbers which divide exactly into 24}

2) Write the following sets using a description instead of a list:

X = {1, 4, 9, 16, 25, 36, 49, 64, 81}

Y = {John Lennon, Paul McCartney, George Harrison, Ringo Starr}

Z = {12, 14, 16, 18}

3)(a) For the sets in questions 1, what is $n(A)$, $n(B)$, $n(C)$?

(b) Is $n(A) = n(C)$?

(c) Is $A = C$?

4) In this question we are using the following sets:

$P = \{\text{multiples of 3}\}$ $Q = \{\text{integers less than 12}\}$ $R = \{\text{prime numbers}\}$

Copy and complete the following using either \in or \notin :

(a) $7 \dots Q$ (b) $7 \dots P$ (c) $7 \dots R$ (d) $13 \dots Q$ (e) $13 \dots R$ (f) $99 \dots P$

5) Which of the following are equal to \emptyset ?

(a) {members of your class over 2 metres tall}

(b) {triangles with 4 sides}

(c) {men who have stood on the moon}

6) Copy each of the following and write after it true (T) or false (F)

(a) $\{2, 3, 4\} \subset \{1, 2, 3, 4, 5\}$

(b) $\{1, 2, 3, 4, 5\} \subset \{2, 3, 4\}$

(c) $\{3, 5, 6\} \subset \{\text{multiples of 3}\}$

(d) $\{2, 4, 6\} \subset \{2, 4, 6\}$

(e) $\emptyset \subset \{2, 4, 6\}$

(f) If $A \subset B$ then $n(A) \leq n(B)$

(g) $n(\emptyset) = 0$

(h) If $n(A) \leq n(B)$ then $A \subset B$

7) (a) List all the subsets of $\{a, b, c\}$

(b) List all the subsets of $\{a, b\}$

(c) List all the subsets of $\{a\}$

(d) List all the subsets of \emptyset

(e) Use your answers to parts (a) to (d) to copy and complete this table, and then write down a rule about what you notice from the table.

Set A	$n(A)$	No of subsets of A
\emptyset	0	
$\{a\}$	1	
$\{a,b\}$	2	
$\{a,b,c\}$	3	

(f) According to your rule, how many subsets should there be of $\{a,b,c,d\}$? Check your rule by writing them all down.

8) In this question we are using the following sets:

$A = \{1, 2, 3, 4, 5\}$

$B = \{1, 3, 5\}$

$C = \{\text{even numbers less than 20}\}$ $D = \{\text{prime numbers less than 20}\}$

List the following sets:

(a) C (b) D (c) $A \cap C$ (d) $A \cap D$ (e) $A \cap B$ (f) $B \cap C$

(g) $C \cap D$ (h) What set is $A \cap B$ the same as? Why is this?

9) Draw Venn Diagrams to illustrate the following sets:

(a) $E = \{1,2,3,\dots,12\}$, $A = \{\text{odd numbers}\}$, $B = \{\text{factors of 12}\}$

(b) $E = \{1,2,3,\dots,12\}$, $P = \{3,5,7\}$, $Q = \{\text{prime numbers}\}$

(c) $E = \{1,2,3,\dots,12\}$, $X = \{\text{odd numbers}\}$, $Y = \{\text{multiples of 4}\}$

(d) $E = \{a,b,c,\dots,j\}$, $A = \{\text{vowels}\}$, $B = \{\text{letters in the word "cabbage"}\}$

(e) $E = \{1,2,3,\dots,12\}$, $P = \{\text{even numbers}\}$, $Q = \{\text{multiples of 4}\}$