Numbers

Real Numbers :- Numbers on a number line

Integers :- Whole numbers (can be positive or negative)

Prime Numbers :- Numbers that have two distinct factors (1 and another no.)

$$2, 3, 5, 7, 11$$

$\longrightarrow$ Only even prime number

Composite Numbers :- Numbers that have more than 2 distinct factors

Factor :- Number that divides completely meaning it leaves no remainder.

Multiple :- Number that can be divided completely.

Always $\geqslant$ to the Factor

3 is a factor of 6 $\Rightarrow$ True
6 is a factor of 24 $\longrightarrow$ True
12 is a factor of 4 $\longrightarrow$ False

Perfect Square :- Square of an integer

Perfect Cube :- Cube of an integer

Prime factorisation: When you write a number as a product of its prime factors

Q: Write the following as a product of its prime factors.

(a)

2	6 0
2	3 0
3	1 5
5	5
	1

$\rightarrow 2^2 \times 3 \times 5 \rightarrow 15$

(b)

2	7 2
2	3 6
2	1 8
3	9
3	3
	2

$\rightarrow 2^3 \times 3^2 \rightarrow 72$

(c)

2	6 4
2	3 2
2	1 6
2	8
2	4
2	2
	1

$\rightarrow$ $2^6 \rightarrow 64$ ✔

(d)

2	3 6
2	1 8
3	9
3	3
	1

$\rightarrow$ $2^2 \times 3^2 \rightarrow 36$ ✔

(e)

2	4 8
2	2 4
2	1 2
2	6
3	3
	1

$\rightarrow$ $2^4 \times 3 \rightarrow 48$ ✔

(f)

2	1 4 4
2	7 2
2	3 6
2	1 8
3	9
3	3
	1

$\rightarrow$ $2^4 \times 3^2 \rightarrow 144$ ✔

Qs2

(a) Write 72 as a product of its prime factors

$$
\begin{array}{c|cc}
2 & 7 & 2 \\
2 & 3 & 6 \\
2 & 1 & 8 \\
3 & & 9 \\
3 & & 3 \\
  & & 1 \\
\end{array}
$$

$\rightarrow$ $2^3 \times 3^2 \rightarrow 72$

(b) find the smallest value of K → integer, such that $72K$ is a perfect square

$72 = \begin{bmatrix} 2^3 \times \cancel{3^2} \\ \\ 72(K) = \rightarrow 2^{3+1} \times \cancel{3^2} \end{bmatrix}$ The power on 2 is odd
→ to be a perfect square all powers must be even

$K = 2$

(a) Write 48 as a product of its prime factors

(a)
$$
\begin{array}{c|cc}
2 & 4 & 8 \\
2 & 2 & 4 \\
2 & 1 & 2 \\
2 & & 6 \\
3 & & 3 \\
  & & 1 \\
\end{array}
$$

$\rightarrow$ $2^4 \times 3 \rightarrow 48$ ✓

(b) find the smallest value of K [integer], such that 48K is a perfect square

$$2^4 \times 3 = 48$$

$$2^4 \times 3^2 = 48K$$

$$\boxed{K = 3}$$

(a) Write 72 as a product of its prime factors

2	7 2
2	3 6
2	8
3	9
3	3
	1

$\rightarrow$ $2^3 \times 3^2 \rightarrow 72$

for cube just make powers divisible by 3

Numbers

__Real Numbers__ : Numbers on a number line

Integers : $\underbrace{-3, -2, -1}_{-ve}, \underset{\downarrow}{0}, \underbrace{1, 2, 3}_{+ve}$

Neutral

Prime Numbers : Numbers that have only two distinct (factors)

$$2, 3, 5, 7, 11$$

$\rightarrow$ Only even prime number

Composite Number : Numbers that have more than two distinct (factors)

$$4, 9, 16, \_\_$$

Factor : Number that divides leaving no remainder $\Big\}$ Multiple $\geqslant$ Factor

Multiple : Number that can be divided completely.

3 is a factor of 6   (T) F

6 is a factor of 24   (T) F

12 is a ~~factor~~ of 4   T (F)
      multiple