What is a prime number?

A positive integer greater than 1 which is divisible only by 1 and itself.

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37,

Writing integers a products of prime factors

Use repeated division or factor trees

Ex1 36

$$\begin{array}{r|l} 2 & 36 \\ 2 & 18 \\ 3 & 9 \\ 3 & 3 \\ & 1 \end{array}$$

$36 = 2 \times 2 \times 3 \times 3$

$36 = 2^2 \times 3^2$

Ex2 120

$$\begin{array}{r|l} 2 & 120 \\ 2 & 60 \\ 2 & 30 \\ 3 & 15 \\ 5 & 5 \\ & 1 \end{array}$$

$120 = 2 \times 2 \times 2 \times 3 \times 5$

$120 = 2^3 \times 3 \times 5$

Ex3 17

$17 = 17$

Exercise Write as product of prime factors

1) 20

$$\begin{array}{r|l} 2 & 20 \\ 2 & 10 \\ 5 & 5 \\ & 1 \end{array}$$

$20 = 2 \times 2 \times 5$

$20 = 2^2 \times 5$

2) 48

$$\begin{array}{r|l} 2 & 48 \\ 2 & 24 \\ 2 & 12 \\ 2 & 6 \\ 3 & 3 \\ & 1 \end{array}$$

$48 = 2 \times 2 \times 2 \times 2 \times 3$

$48 = 2^4 \times 3$

3) 1000

$$\begin{array}{r|l} 2 & 1000 \\ 2 & 500 \\ 2 & 250 \\ 5 & 125 \\ 5 & 25 \\ 5 & 5 \\ & 1 \end{array}$$

$1000 = 2 \times 2 \times 2 \times 5 \times 5 \times 5$

$1000 = 2^3 \times 5^3$

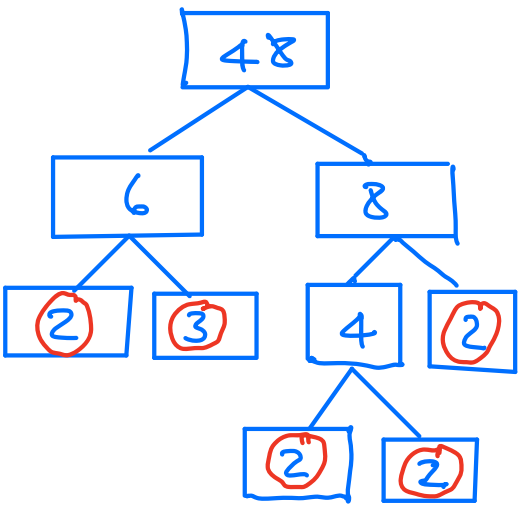
4) 98

$$\begin{array}{r|l} 2 & 98 \\ 7 & 49 \\ 7 & 7 \\ & 1 \end{array}$$

$98 = 2 \times 7 \times 7$

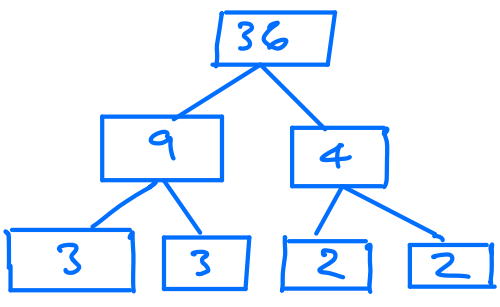
$98 = 2 \times 7^2$

Factor Trees 48



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

Exercise Factor tree for 36



$36 = 2 \times 2 \times 3 \times 3$
$= 2^2 \times 3^2$

Highest Common Factors HCF

Ex Find HCF of 54 and 72

$$\begin{array}{r|l} 2 & 54 \\ 3 & 27 \\ 3 & 9 \\ 3 & 3 \\ & 1 \end{array} \qquad \begin{array}{r|l} 2 & 72 \\ 2 & 36 \\ 2 & 18 \\ 3 & 9 \\ 3 & 3 \\ & 1 \end{array}$$

$54 = 2 \times 3 \times 3 \times 3$

$72 = 2 \times 2 \times 2 \times 3 \times 3$

HCF $2 \times 3 \times 3 = 18$

Ex2 Find HCF of 42 and 70

$$\begin{array}{r|l} 2 & 42 \\ 3 & 21 \\ 7 & 7 \\ & 1 \end{array} \qquad \begin{array}{r|l} 2 & 70 \\ 5 & 35 \\ 7 & 7 \\ & 1 \end{array}$$

$42 = 2 \times 3 \times 7$

$70 = 2 \times 5 \times 7$

HCF $= 2 \times 7 = 14$

LCM

$54 = 2 \times 3 \times 3 \times 3$

$72 = 2 \times 2 \times 2 \times 3 \times 3$

$LCM = 2 \times 2 \times 2 \times 3 \times 3 \times 3$

216

54 108 162 **216** 270

72 144 **216**