

## Prime Factors and Factor Trees

By drawing factor trees, write the following numbers as a product of their prime factors.

- |        |         |
|--------|---------|
| (a) 15 | (b) 22  |
| (c) 28 | (d) 24  |
| (e) 32 | (f) 42  |
| (g) 50 | (h) 54  |
| (i) 60 | (j) 75  |
| (k) 80 | (l) 100 |

- (a)  $3 \times 5$  (b)  $2 \times 11$   
(c)  $2 \times 2 \times 7$  (d)  $2 \times 2 \times 2 \times 3$   
(e)  $2 \times 2 \times 2 \times 2 \times 2$  (f)  $2 \times 3 \times 7$   
(g)  $2 \times 5 \times 5$  (h)  $2 \times 3 \times 3 \times 3$   
(i)  $2 \times 2 \times 3 \times 5$  (j)  $3 \times 5 \times 5$   
(k)  $2 \times 2 \times 2 \times 2 \times 5$  (l)  $2 \times 2 \times 5 \times 5$

As a product of its primes, what number is given by:

- (a)  $2 \times 5 \times 11$   
(b)  $3 \times 3 \times 5$   
(c)  $2 \times 5 \times 7$   
(d)  $2 \times 2 \times 3 \times 3 \times 5$

- (a) 110  
(b) 45  
(c) 70  
(d) 180

For each of these numbers, draw a factor tree and write as a product of its prime factors.

- |        |        |
|--------|--------|
| (a) 4  | (b) 9  |
| (c) 16 | (d) 25 |
| (e) 36 | (f) 81 |

What do you notice?

- (a)  $2 \times 2$  (b)  $3 \times 3$   
(c)  $2 \times 2 \times 2 \times 2$  (d)  $5 \times 5$   
(e)  $2 \times 2 \times 3 \times 3$  (f)  $3 \times 3 \times 3 \times 3$

There are always an even number of prime factors & they are in pairs. They are all square numbers.

As a product of its prime factors,  $120 = 2 \times 2 \times 2 \times 3 \times 5$ . How could you use this information to find all the factors of 120, making sure you do not miss any factor pairs?

work out all the combinations of factor pairs

- eg. 2 and  $2 \times 2 \times 3 \times 5$   
3 and  $2 \times 2 \times 2 \times 5$   
5 and  $2 \times 2 \times 2 \times 3$   
 $2 \times 2$  and  $2 \times 3 \times 5$ .