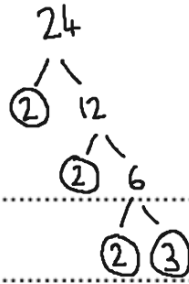


Prime Factors - Past Paper Questions

24 can be written as $24 = 2^a \times 3$

What is the value of a ?

.....
 $2^3 \times 3$



Answer $a = \dots 3$

11

$$A = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7$$

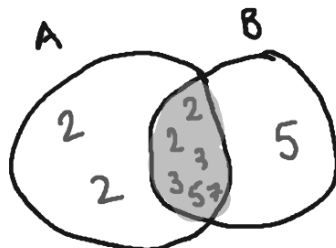
$$B = 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7$$

Created by W Neill

(a) Write A using index notation.

(a) $2^4 \times 3^2 \times 5 \times 7$ [1]

(b) Show that the highest common factor (HCF) of A and B is 1260. [2]



$$2 \times 2 \times 3 \times 3 \times 5 \times 7 = 1260$$

(c) Show that B is larger than A, without working them out.

$$A = 1260 \times 4 \quad \therefore B \text{ is larger.}$$

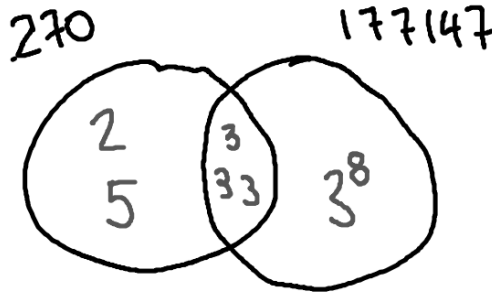
$$B = 1260 \times 5$$

11 You are given that

$$270 = 3^3 \times 2 \times 5 \quad \text{and} \quad 177147 = 3^{11}$$

- (a) (i) Find the lowest common multiple (LCM) of 270 and 177147.
Give your answer using power notation and as an ordinary number.

N23



- (a)(i) using power notation $3^{11} \times 2 \times 5$
as an ordinary number 1771470 [2]

- (ii) Write 177147000000 as a product of its prime factors.

$$3^{11} \times 1000000$$

$$3^{11} \times \underline{5 \times 2} \times \underline{5 \times 2} \times \underline{5 \times 2} \times \underline{5 \times 2} \times \underline{5 \times 2} \times \underline{5 \times 2}$$

N21

- (ii) $3^{11} \times 2^6 \times 5^6$ [3]

21 N is a number.

As a product of prime factors in index form $N = 2^1 \times 3^4 \times y^3$

N18

N21

Work out $3N^2$ as a product of prime factors in index form.

Give your answer in terms of y .

[3 marks]

$$3 \times N^2$$

$$(2^1 \times 3^4 \times y^3) \times (2^1 \times 3^4 \times y^3) \\ = 2^2 \times 3^8 \times y^6 \times 3^1$$

Answer $2^2 \times 3^9 \times y^6$

Jenny is organising a barbecue.

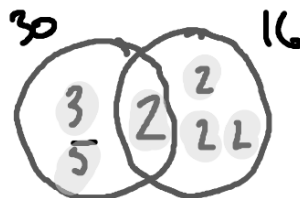
There are 30 bread rolls in a pack. ²⁴⁰

There are 16 sausages in a pack. ²⁴⁰

She needs **exactly** the same number of bread rolls as sausages.

What is the smallest number of each pack she must buy?

You **must** show all your working.



..... $240 \div 30 = 8$

..... $240 \div 16 = 15$

Answer 8 packs of rolls

and 15 packs of sausages

(Total 3 marks)



$$30 = 1 \times 3 \times 5$$

$$\text{LCM} = 240$$

$$16 = 2 \times 2 \times 2 \times 2$$

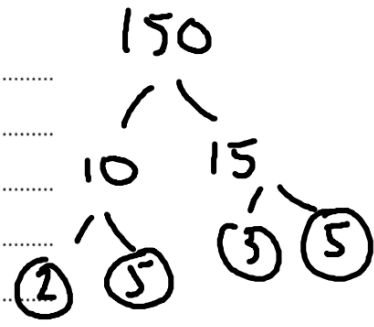


When written as the product of prime factors

$$225 = 3^2 \times 5^2$$

- (a) Write 150 as the product of prime factors.
Give your answer in index form.

.....
.....
.....
.....



Answer $2 \times 3 \times 5^2$

(3)

- (b) Work out the highest common factor (HCF) of 225 and 150.

.....
 $225 = 3 \times 3 \times 5 \times 5$
.....
 $150 = 2 \times 3 \times 5 \times 5$
.....
 $3 \times 5 \times 5$
.....



Answer 75

(2)