

Name: _____

Exam Style Questions

Product of Primes LCM and HCF



Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

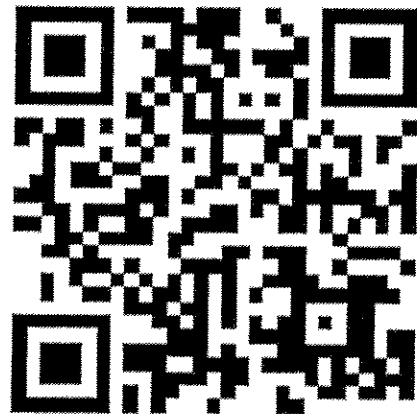
1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

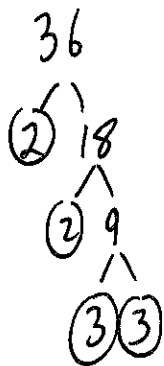
www.corbettmaths.com/contents

Video 223

Video 224



1. Express 36 as a product of its prime factors.

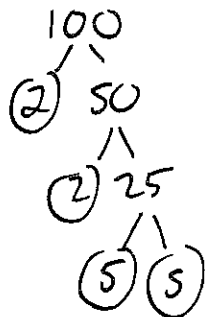


$$2 \times 2 \times 3 \times 3$$

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

.....
(2)

2. Express 100 as a product of its prime factors.

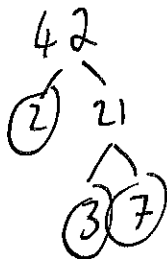


$$2 \times 2 \times 5 \times 5$$

$$2^2 \times 5^2$$

.....
(2)

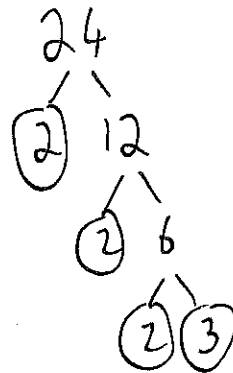
3. Write 42 as a product of its prime factors.



$$2 \times 3 \times 7$$

.....
(2)

4. Write 24 as the product of its prime factors.
Give your answer in index form.

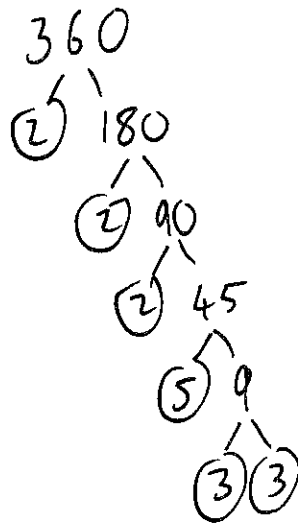


$$2 \times 2 \times 2 \times 3$$

$$= 2^3 \times 3$$

.....
(3)

5. Write 360 as a product of its prime factors.



$$2 \times 2 \times 2 \times 3 \times 3 \times 5$$

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

.....
(2)

6. A number is written as a product of its prime factors as $2 \times 3^2 \times 5$

Work out the number.

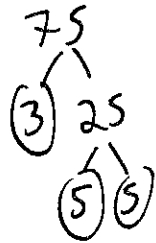
$$2 \times 9 \times 5$$

90

.....
(2)

7. $3x^2 = 75$

(a) Find the value of x.



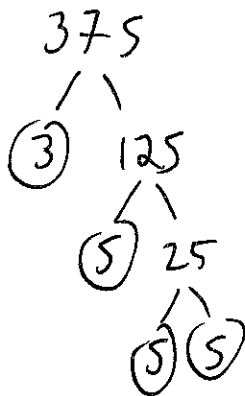
or $3x^2 = 75$
 $x^2 = 25$
 $x = \pm 5$

5 (and -5)
(2)

(b) Express 75 as a product of its prime factors.

$3 \times 5 \times 5$
 3×5^2
(2)

8. You are given that $3x^3 = 375$
Find the value of x.



or $3x^3 = 375$
 $x^3 = 125$
 $x = 5$

$x = 5$
(2)

9. You are given that $m = 2^3 \times 5$

(a) Calculate $10m$

$$m = 40$$

$$10 \times 40 = 400$$

$$\frac{400}{(2)}$$

(b) Write $10m$ as a product of primes

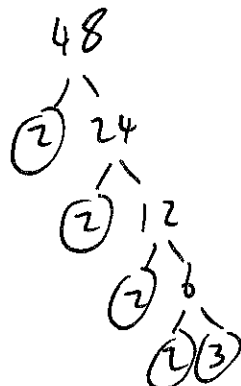
$$m = 2^3 \times 5$$

$$10m = 2^3 \times 5 \times 2 \times 5$$

$$10m = 2^4 \times 5^2$$

$$\frac{2^4 \times 5^2}{(2)}$$

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

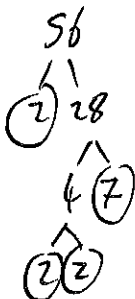


$$2 \times 2 \times 2 \times 2 \times 3$$

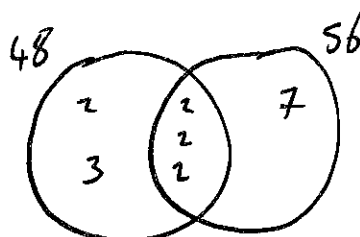
$$2^4 \times 3$$

$$\frac{2^4 \times 3}{(2)}$$

(b) Find the Highest Common Factor (HCF) of 48 and 56.



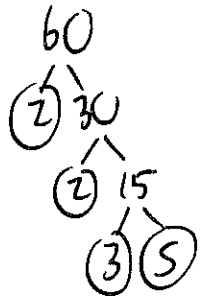
$$56 = 2 \times 2 \times 2 \times 7$$



$$HCF = 2 \times 2 \times 2 = 8$$

$$\frac{8}{(2)}$$

11. (a) Write 60 as a product of its prime factors.

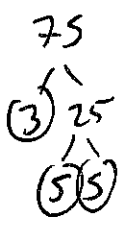


$$2 \times 2 \times 3 \times 5$$

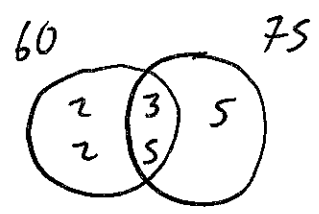
$$\underline{\underline{2^2 \times 3 \times 5}}$$

(2)

(b) Find the Lowest Common Multiple (LCM) of 60 and 75.



$$75 = 3 \times 5 \times 5$$

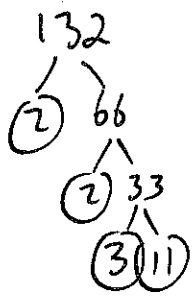


$$LCM = 2 \times 2 \times 3 \times 5 \times 5$$

$$\underline{\underline{300}}$$

(2)

12. (a) Write 132 as a product of its prime factors.

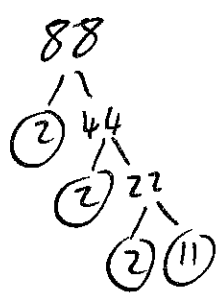


$$2 \times 2 \times 3 \times 11$$

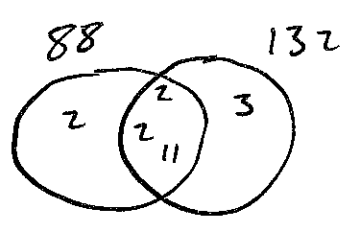
$$\underline{\underline{2^2 \times 3 \times 11}}$$

(2)

(b) Find the Highest Common Factor (HCF) of 88 and 132.



$$2 \times 2 \times 2 \times 11$$



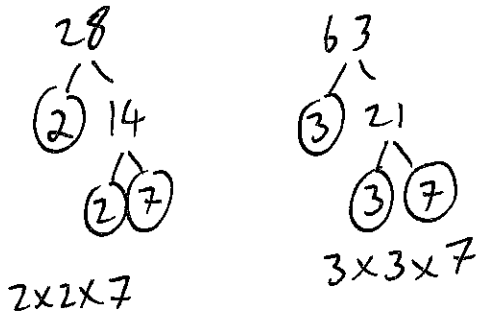
$$HCF = 2 \times 2 \times 11$$

$$= 44$$

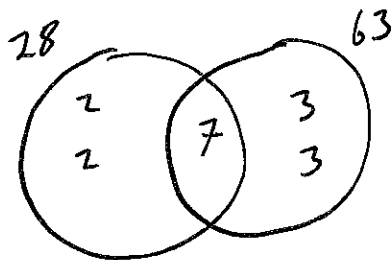
$$\underline{\underline{44}}$$

(2)

13. Find the least common multiple (LCM) of 28 and 63.



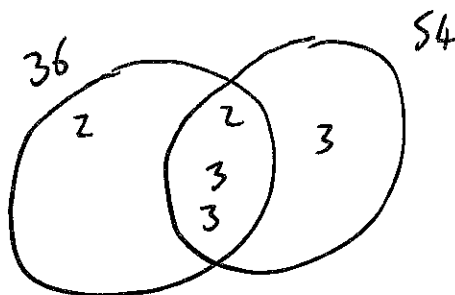
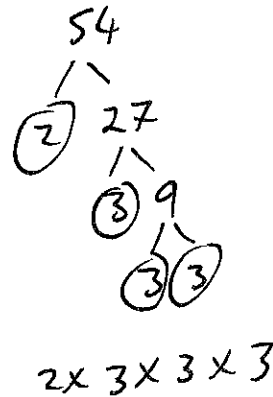
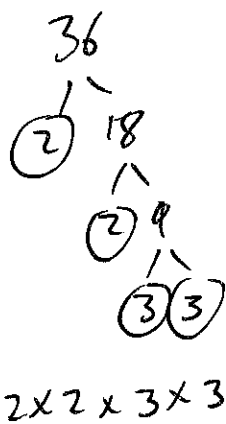
$$\begin{aligned} \text{LCM} &= 2 \times 2 \times 7 \times 3 \times 3 \\ &= 252 \end{aligned}$$



252

(2)

14. Find the least common multiple (LCM) of 36 and 54.



108

(2)

$$\text{LCM} = 2 \times 2 \times 3 \times 3 \times 3 = 108$$

15. You are given that $45 = 3^2 \times 5$

(a) Write each of the following as the product of prime factors in index form.

(i) 90

$$45 \times 2 = 90$$

$$(3^2 \times 5) \times 2$$

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

(1)

(ii) 135

$$45 \times 3 = 135$$

$$(3^2 \times 5) \times 3$$

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

(1)

(iii) 450

$$45 \times 10 = 450$$

$$(3^2 \times 5) \times (2 \times 5)$$

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

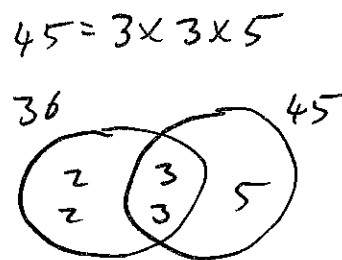
(1)

(b) What is the least common multiple (LCM) of 36 and 45.

$$36$$

$$\begin{array}{c} \diagup \\ \textcircled{2} 18 \\ \diagdown \\ \textcircled{2} 9 \\ \diagup \quad \diagdown \\ \textcircled{3} \quad \textcircled{3} \end{array}$$

$$2 \times 2 \times 3 \times 3$$



$$LCM =$$

$$2 \times 2 \times 3 \times 3 \times 5$$

$$\underline{180}$$

(2)

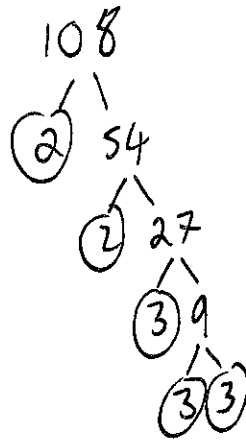
(c) What is the highest common factor (HCF) of 36 and 45.

$$HCF = 3 \times 3$$

$$\underline{9}$$

(2)

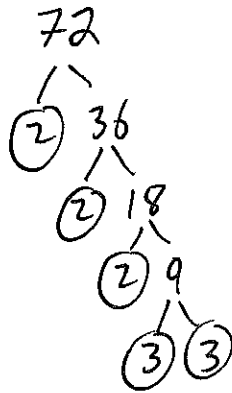
16. (a) Express 108 as a product of its prime factors.
Give your answer in index form.



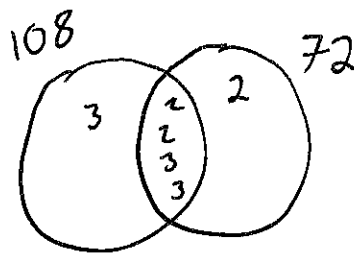
$$2 \times 2 \times 3 \times 3 \times 3$$

$$\frac{2^2 \times 3^3}{\dots\dots\dots} \quad (3)$$

- (b) Find the Highest Common Factor (HCF) of 108 and 72.



$$2 \times 2 \times 2 \times 3 \times 3$$



$$\frac{36}{\dots\dots\dots} \quad (2)$$

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

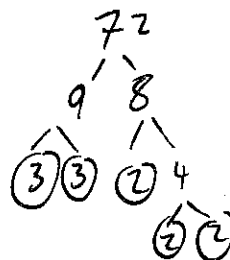
17. (a) Work out 6×12 as the product of prime factors.
Give your answer in index form.

$$6 = 2 \times 3$$

$$12 = 2 \times 2 \times 3$$

$$6 \times 12 = 2 \times 2 \times 2 \times 3 \times 3$$

or $6 \times 12 = 72$



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

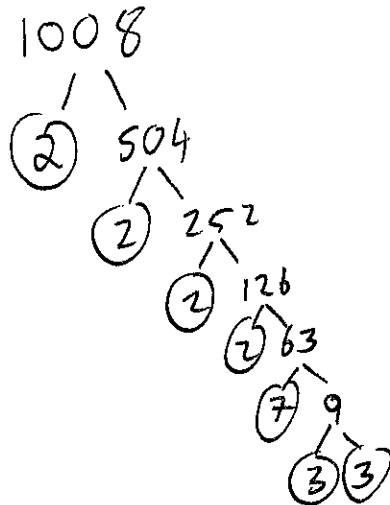
.....
(3)

- (b) Find the Highest Common Factor (HCF) of y and $5y$.

$$y$$

.....
(1)

18. (a) Write 1008 as a product of prime factors.
Express your answer in index form.



$$2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7$$

$$\underline{2^4 \times 3^2 \times 7}$$

(3)

- (b) Hence find the **least** number by which 1008 would need to be multiplied by to give a square number.

~~1008~~
$$2^4 \times 3^2 \times 7$$

$$\downarrow \times 7$$

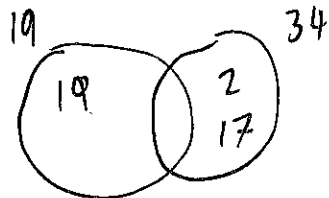
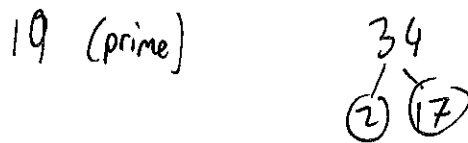
$$2^4 \times 3^2 \times 7^2 = 7056$$

$$\sqrt{7056} = 84$$

$$\underline{7}$$

(1)

19. Find the lowest common multiple of 19 and 34.



$$LCM = 2 \times 17 \times 19$$

$$\underline{646}$$

(2)