

Calculator Questions

Prime Factors, HCF & LCM

Prime Factor Decomposition / Uses of Prime Factor Decomposition / HCF & LCM

Easy (3 questions)	/8
Medium (11 questions)	/32
Hard (6 questions)	/16
Total Marks	/56

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Easy Questions

1 Write 84 as a product of its prime factors.

(2 marks)

2 Write 525 as a product of its prime factors.

(3 marks)

3 Trams leave Piccadilly

to Eccles every 9 minutes

to Didsbury every 12 minutes

A tram to Eccles and a tram to Didsbury both leave Piccadilly at 9 am.

At what time will a tram to Eccles and a tram to Didsbury next leave Piccadilly at the same time?

(3 marks)

Medium Questions

- 1** Find the highest common factor (HCF) of 90 and 48.

(2 marks)

- 2 (a)** Write 56 as a product of its prime factors.

(2 marks)

- (b)** Find the lowest common multiple (LCM) of 56 and 42.

(2 marks)

- 3** Buses to Acton leave a bus station every 24 minutes. Buses to Barton leave the same bus station every 20 minutes.

A bus to Acton and a bus to Barton both leave the bus station at 9 00 am.

When will a bus to Acton and a bus to Barton next leave the bus station at the same time?

(3 marks)

- 4 (a)** Express 180 as a product of its prime factors.

(3 marks)

(b) Martin thinks of two numbers.

He says,

"The Highest Common Factor (HCF) of my two numbers is 6

The Lowest Common Multiple (LCM) of my two numbers is a multiple of 15"

Write down **two** possible numbers that Martin is thinking of.

(2 marks)

5 (a) $A = 3^2 \times 5^4 \times 7$ $B = 3^4 \times 5^3 \times 7 \times 11$

Find the highest common factor (HCF) of A and B .

(2 marks)

(b) Find the lowest common multiple (LCM) of A and B .

(2 marks)

6 $A = 3^5 \times 5 \times 7^3$
 $B = 2^3 \times 3 \times 7^4$

i) Find the Highest Common Factor (HCF) of A and B .

[1]

ii) Find the Lowest Common Multiple (LCM) of A and B .

[1]

(2 marks)

7 Work out the lowest common multiple (LCM) of 36 and 120.

(2 marks)

8

$$A = 2^3 \times 3^2 \times 5^2 \times 11$$
$$B = 2^4 \times 3 \times 5^4 \times 13$$

Find the lowest common multiple (LCM) of A and B .
Give your answer as a product of powers of prime numbers.

(2 marks)

- 9** A machine has a buzzer that sounds every 50 minutes. The machine also has a bell that sounds every 80 minutes.

The buzzer and the bell sound together at 10 am.

Find the time at which they next sound together.

(3 marks)

- 10** Work out the lowest common multiple (LCM) of 120 and 144.

(2 marks)

- 11 (a)** Written as the product of its prime factors

$$672 = 2^5 \times 3 \times 7$$

Write 252 as the product of its prime factors.

(2 marks)

- (b)** Work out the value of the highest common factor of 672 and 252.

(1 mark)

Hard Questions

- 1 Find the highest **odd** number that is a factor of 60 and a factor of 90.

(1 mark)

- 2 Here are three lamps.

lamp A



lamp B



lamp C



Lamp **A** flashes every 20 seconds.

Lamp **B** flashes every 45 seconds.

Lamp **C** flashes every 120 seconds.

The three lamps start flashing at the same time.

How many times in one hour will the three lamps flash at the same time?

(3 marks)

- 3 (a) Find the lowest common multiple (LCM) of 40 and 56.

(2 marks)

(b) $A = 2^3 \times 3 \times 5$ $B = 2^2 \times 3 \times 5^2$

Write down the highest common factor (HCF) of A and B .

(1 mark)

- 4 (a)** Write 720 as a product of its prime factors.
Show your working clearly.

(2 marks)

- (b)** Find the smallest whole number that 720 can be multiplied by to give a square number.

(1 mark)

5 (a) Find the highest common factor (HCF) of 96 and 120.

(2 marks)

$$A = 2^3 \times 5 \times 7^2 \times 11$$

(b) $B = 2^4 \times 7 \times 11$

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

Find the lowest common multiple (LCM) of A , B and C .

(2 marks)

$$A = 3^5 \times 5 \times 7^3$$

6 $B = 2^3 \times 3 \times 7^4$

$$C = 2^p \times 5^q \times 7^r$$

Given that

the HCF of B and C is $2^3 \times 7$

the LCM of A and C is $2^4 \times 3^5 \times 5^2 \times 7^3$

Find the value of p , the value of q and the value of r .

$$p = \dots\dots\dots$$

$$q = \dots\dots\dots$$

$$r = \dots\dots\dots$$

(2 marks)