



Product of Primes LCM HCF



27 minutes



22 marks

Q1. Write 108 as the product of its prime factors.
Give your answer in index form.

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

Answer

(Total 3 marks)

Q2. Tom, Sam and Matt are counting drum beats.

Tom hits a snare drum every 2 beats.
Sam hits a kettle drum every 5 beats.
Matt hits a bass drum every 8 beats.

Tom, Sam and Matt start by hitting their drums at the same time.
How many beats is it before Tom, Sam and Matt **next** hit their drums at the **same** time?

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Answer beats

(Total 2 marks)

Q3. Work out the Highest Common Factor (HCF) of 63 and 105.

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Answer

(Total 2 marks)

Q4. 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.

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Answer

(3)

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

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.....

Answer

(2)

(Total 5 marks)

Q5. Jenny is organising a barbecue.
 There are 30 bread rolls in a pack.
 There are 16 sausages in a pack.
 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.

.....

Answer packs of rolls
 and packs of sausages

(Total 3 marks)

Q6. Polly Parrot squawks every 12 seconds.
 Mr Toad croaks every 21 seconds.
 They both make a noise at the same time.

After how many seconds will they next make a noise at the same time?

.....

Answer seconds

(Total 2 marks)

Q7. $N = a^2b$ is a formula where a and b are prime numbers.

(a) Find N when $a = 5$ and $b = 3$

.....

Answer $N =$

(1)

(b) When $a = b$, what sort of number is N ?

Circle the correct answer.

PRIME

SQUARE

CUBE

(1)

(c) Find the values of a and b when $N = 2009$

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

Answer $a = \dots\dots\dots b = \dots\dots\dots$

(3)
(Total 5 marks)

M1. 2 (x) 54 or 3 (x) 36
*Using 2 or 3 in valid method
 eg factor tree
 Do not award for a list of all factors
 even if in product pairs*

M1

2 (x) 2 (x) 3 (x) 3 (x) 3
Condone use of 1

A1

$2^2 \times 3^3$ *Do not allow factor of 1*

A1

[3]

M2. Attempt to find LCM of 2, 5 and 8 **or**
 any common multiple of 2, 5 and 8, eg. 80, 120 ...
*or 1, 3, 5, 7, 9 ...
 and 1, 6, 11, 16, 21 ...
 and 1, 9, 17, 25, 33, 41 ...*

M1

40

or 41

A1

[2]

M3. Prime factorisation of either number correct (any form)

$$63 = 3^2 \times 7$$

$$105 = 3 \times 5 \times 7$$

M1

21

A1

Alt

List factors of at least one number correctly (excl 1 and itself)

$$63 = (1,) 3, 7, 9, 21 (, 63)$$

$$105 = (1,) 3, 5, 7, 15, 21, 35 (, 105)$$

M1

21

A1

[2]

M4. (a) 2 (and) 75 or 3 (and) 50 or 5 (and) 30
Do not allow for a list of factors even in pairs M1

2 (x) 3 (x) 5 (x) 5
Condone factor of 1 A1

$2 \times 3 \times 5^2$
Must have x signs
Do not allow factor of 1 A1

(b) 3 (x) 5 (x) 5
Selects all common factors from $3^2 \times 5^2$ and their (a) M1

75
SC1 Answer 15 or 25 A1

[5]

M5. Using multiples
Using prime factors: $30 = 2 \times 3 \times 5$;
 $16 = 2^4$ M1

30, 60, 90....., 240
16, 32, 48....., 240
 $LCM = 2^4 \times 3 \times 5 = 240$
Sight of 240 scores M1A1 A1

8 pack buns. 15 of sausages
A pair of values giving equal numbers of buns and sausages score
M1A1A0
Correct answer with no working scores full marks A1

[3]

M6. Attempt to find LCM of 12 and 21

or any common multiple of 12 and 21 eg, 252

12, 24 ... and 21, 42 ... minimum

12 x 21 is enough

Factors of 12 and 21 with attempt at LCM

M1

84

Allow 85

(those who assume they start after 1 sec)

A1

[2]

M7. (a) 75

B1

(b) Cube

B1

(c) Division by the square of a prime

M1

$a = 7$

A1

$b = 41$

Allow reverse

NB if only one answer given must be correct and gets M1,A1

A1

[5]

