



Integers, Powers and Roots (F)

Intervention Booklet

Types of Numbers

Things to remember:

- A factor is a whole number that divides exactly into another number.
- A multiple is a number that may be divided by another a certain number of times without a remainder.
- A prime number only has 2 factors – 1 and itself.
- A power tells us how many times the base number has been multiplied by itself
- A root is the opposite of a power.
- A square number is the result of multiplying an integer (whole number) by itself.

Questions:

1. (a) Write down the square of 8

.....
(1)

(b) Write down the value of 10^3

.....
(1)

(c) Estimate the value of $\sqrt{20}$

.....
(1)

(Total for Question is 3 marks)

2. Here is a list of eight numbers: 4 5 4 25 29 30 33 39 40
From the list, write down

(i) a factor of 20

.....

(ii) a multiple of 10

.....

(iii) the prime number that is greater than 15

.....

(Total for Question is 3 marks)

3. Express 180 as a product of its prime factors.

.....
(Total for Question is 3 marks)

4. (a) Write down the value of 7^2
.....
(1)

(b) Write down the value of $\sqrt{25}$
.....
(1)

(c) Write down the value of 2^3
.....
(1)

(Total for Question is 3 marks)

5. (a) Write down the value of $\sqrt{81}$
.....
(1)

(b) Work out the value of $5^2 + 2^3$
.....
(2)

(Total for Question is 3 marks)

6. Here is a list of numbers:
2 3 10 12 15 16 24
From the list write down
(2) an odd number

(b) a multiple of 6
.....
(1)

(c) a factor of 18
.....
(1)

(Total for Question is 3 marks)

7. Here is a list of numbers.
2 3 5 8 10 16 21 24
From the numbers in the list,

(2) write down an odd number
.....
(1)

(b) write down the square number
.....
(1)

(c) write down the number which is a multiple of 6
.....
(1)

(Total for Question is 3 marks)

8. Here is a list of numbers.

1 2 4 5 7 11 13 14 15 17

From the list, write down three different prime numbers that add together to make 20

.....
(Total for Question is 3 marks)

HCF and LCM

Things to remember:

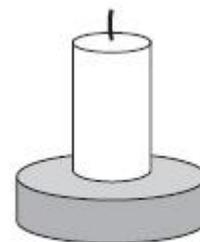
- A factor is a whole number that divides exactly into another number.
- A multiple is a number that may be divided by another a certain number of times without a remainder.
- A prime number only has 2 factors – 1 and itself.
- HCF is an abbreviation of Highest Common Factor and LCM of Lowest Common Multiple.

Questions:

1. Tom and Amy set the alarms on their phones to sound at 6.45 am.
Both alarms sound together at 6.45 am.
Tom's alarm then sounds every 9 minutes.
Amy's alarm then sounds every 12 minutes.
At what time will both alarms next sound together?

.....
(Total for question = 3 marks)

2. Caroline is making some table decorations.
Each decoration is made from a candle and a holder.
Caroline buys some candles and some holders each in packs.
There are 30 candles in a pack of candles.
There are 18 holders in a pack of holders.
Caroline buys exactly the same number of candles and holders.
(i) How many packs of candles and how many packs of holders does Caroline buy?



candle and holder

..... packs of candles

..... packs of holders

Caroline uses all her candles and all her holders.

(ii) How many table decorations does Caroline make?

..... table decorations
(Total for question = 5 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?

.....
(Total for Question is 3 marks)

4. Rita is going to make some cheeseburgers for a party.
She buys some packets of cheese slices and some boxes of burgers.
There are 20 cheese slices in each packet.
There are 12 burgers in each box.
Rita buys exactly the same number of cheese slices and burgers.
(i) How many packets of cheese slices and how many boxes of burgers does she buy?

..... packets of cheese slices
..... boxes of burgers

Rita wants to put one cheese slice and one burger into each bread roll.
She wants to use all the cheese slices and all the burgers.

(ii) How many bread rolls does Rita need?

..... bread rolls
(Total for Question is 4 marks)

5. Veena bought some food for a barbecue.
She is going to make some hot dogs.
She needs a bread roll and a sausage for each hot dog.
There are 40 bread rolls in a pack.
There are 24 sausages in a pack.
Veena bought exactly the same number of bread rolls and sausages.
(i) How many packs of bread rolls and packs of sausages did she buy?

..... packs of bread rolls

..... packs of sausages.

- (ii) How many hot dogs can she make?

.....
(Total for Question is 5 marks)

6. Find the highest common factor (HCF) of 32, 48 and 72

.....
(Total for question = 2 marks)

7. Write 504 as a product of powers of its prime factors.

.....
(Total for question = 3 marks)

8. John buys some boxes of pencils and some packets of pens for people to use at a conference.
There are 40 pencils in a box.
There are 15 pens in a packet.
John gives one pencil and one pen to each person at the conference.
He has no pencils left.
He has no pens left.
How many boxes of pencils and how many packets of pens did John buy?

..... boxes of pencils

..... packets of pens

(Total for question = 3 marks)

Laws of Indices

Things to remember:

- The exam question will use the word “simplify”
- When multiplying, add the indices
- When dividing, subtract the indices
- With brackets, multiply the indices
- If the exam question has the words “work out the value of”, or “evaluate” it means the answer is a number.
- Anything to the power zero is 1
- Anything to the power one is itself
- Anything to a negative power becomes a reciprocal

Questions:

1. (a) Write down the reciprocal of 5

.....
(1)

(b) Evaluate 3^{-2}

.....
(1)

(Total for Question is 2 marks)

2. (a) Write down the value of $\sqrt{81}$

.....
(1)

(b) Work out the value of $5^2 + 2^3$

.....
(2)

(Total for Question is 3 marks)

3. Write these numbers in order of size. Start with the smallest number.

5^{-1} 0.5 -5 5^0

.....
(Total for Question is 2 marks)

4. (a) Solve $3x^2 = 147$

.....
(2)

(b) Work out the value of 2^{-3}

.....
(1)

(c) Simplify $(3x^2)^3$

.....
(2)

(Total for question = 5 marks)

5. (a) Simplify $a^4 \times a^5$

.....

(1)

(b) Simplify $\frac{45e^6f^8}{5ef^2}$

.....
(2)

(c) Write down the value of $9^{1/2}$

.....
(1)

(Total for Question is 4 marks)

6. (a) Simplify $5^4 \times 5^6$

.....
(1)

(b) Simplify $7^5 \div 7^2$

.....
(1)

(Total for Question is 2 marks)

7. Write down the value of

(i) 7^0

.....

(ii) 5^{-1}

.....

(iii) $9^{1/2}$

.....
(Total for Question is 3 marks)

8. (a) Work out 3^4

.....
(1)

(b) Write down the cube root of 64

.....
(1)

(Total for Question is 2 marks)