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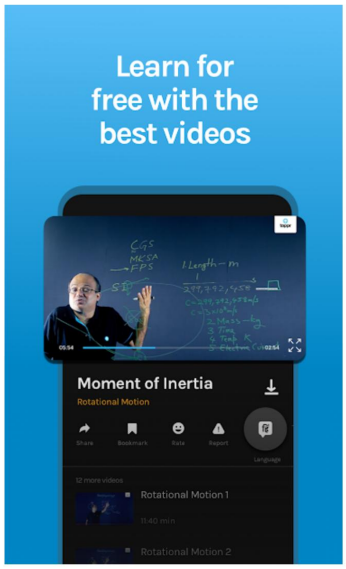

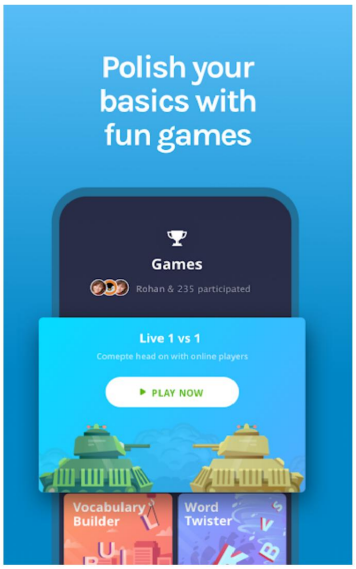

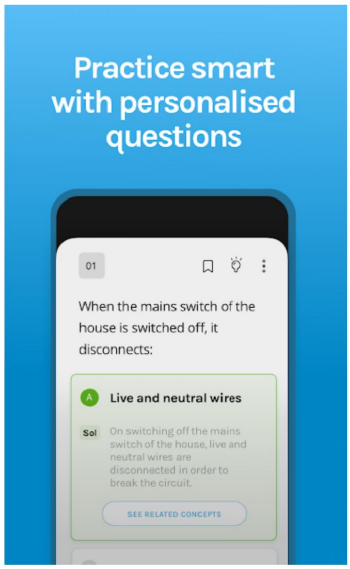

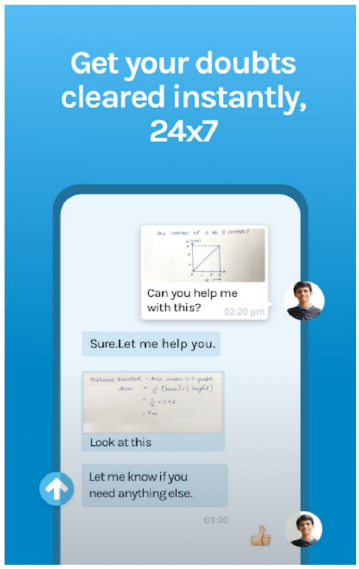

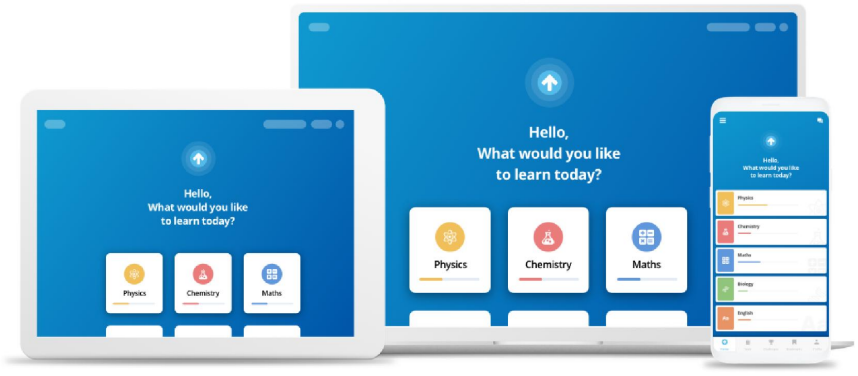

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Q.1. Express each number as a product of its prime factors:
(i) 140 (ii)156 (iii) 3825 (iv) 5005 (v) 7429

SOLUTION

(i) 140

$$140 = 2 \times 70$$
$$= 2 \times 2 \times 35$$
$$= 2 \times 2 \times 5 \times 7$$
$$= 2 \times 2 \times 5 \times 7 \times 1$$

(ii) 156

$$156 = 2 \times 78$$
$$= 2 \times 2 \times 39$$
$$= 2 \times 2 \times 3 \times 13$$
$$= 2 \times 2 \times 3 \times 13 \times 1$$

(iii) 3825

$$3825 = 3 \times 1275$$
$$= 3 \times 3 \times 425$$
$$= 3 \times 3 \times 5 \times 85$$
$$= 3 \times 3 \times 5 \times 5 \times 17$$
$$= 3 \times 3 \times 5 \times 5 \times 17 \times 1$$

(iv) 5005

$$5005 = 5 \times 1001$$
$$= 5 \times 7 \times 143$$
$$= 5 \times 7 \times 11 \times 13$$
$$= 5 \times 7 \times 11 \times 13 \times 1$$

(v) 7429

$$7429 = 17 \times 437$$
$$= 17 \times 19 \times 23$$
$$= 17 \times 19 \times 23 \times 1$$

Q.2. **Evaluate**
(i) 8! ii) 4!−3!

SOLUTION

i) $8! = 1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 = 40320$
ii) $4! = 1 \times 2 \times 3 \times 4 = 24$
$3! = 1 \times 2 \times 3 = 6$
$\therefore 4! - 3! = 24 - 6 = 18$

Q.3. whether 6^n can end with the digit 0 for any natural number n.

SOLUTION

If any digit has the last digit 10 that means it divisible by 10.
The factor of $10 = 2 \times 5$,

So value of $6n$ should be divisible by 2 and 5.

Both $6n$ is divisible by 2 but not divisible by 5.

So, it can not end with 0.

Q.4.

If $\frac{a+2}{2} = \frac{b+4}{4} = \frac{c+6}{6} = 12$, then number of factors of $'abc'$

A 20

B 40

C 45

D 50

SOLUTION

Explanation:-
Since acc. to given ques .

$$\frac{a+2}{2} = \frac{b+4}{4} = \frac{c+6}{6} = 12$$

$$\Rightarrow a = 22, b = 44, c = 66$$

$$\Rightarrow abc = (22)(44)(66) = 63888 = 11^3 \times 2^4 \times 3$$

Number of factors $= (3+1)(4+1)(1+1) = 40$

Factors of 63888 are: 1, 2, 3, 4, 6, 8, 11, 12, 16, 22, 24, 33, 44, 48, 66, 88, 121, 132, 176, 242, 264, 363, 484, 528, 726, 968, 1331, 1452, 1936, 2662, 2904, 3993, 5324, 5808, 7986, 10648, 15972, 21296, 31944, 63888. So, there are total of 40 factors.

Q.5. A number n is said to be 'perfect' if the sum of all its divisors (excluding n itself) is equal to n. An example of a perfect number is

A 9

B 15

C 21

D 6

SOLUTION

Lets check each option one by one
A. 9 divisor are 1 and 3.
$1+3=4 \neq 9$ so not a perfect number.
B. 15 divisors are $1, 3,$ and 5.
$1+3+5=9 \neq 15$ so not a perfect number
C. 21 divisors are 1, 3 and 7.
$1+3+7=11 \neq 21$, so not a perfect number.
D. 6 divisors are $1, 2$ and 3.
$1+2+3=6$ It is a perfect number
So correct answer is option D

Q.6. Express the number as product of its prime factors:
5005

A $4 \times 17 \times 13 \times 7$

B $5 \times 11 \times 13 \times 7$

C $7 \times 11 \times 19 \times 29$

D $5 \times 13 \times 19 \times 29$

SOLUTION

$5005 = 5 \times 7 \times 11 \times 13$

Q.7. The total number of factors for 50 are

A 16

B 6

C 4

D 10

SOLUTION

No. of factors for 50

$50 = 5 \times 5 \times 2 = 5^2 \times 2^1$

Total no. of factors are $= (2+1) \times (1+1) = 6$

Q.8.

$$\sqrt{27 + \sqrt{70 + \sqrt{121}}}$$

A 6

B 7

C 8

D 9

SOLUTION

$$\sqrt{27 + \sqrt{70 + \sqrt{121}}}$$

$$\sqrt{27 + \sqrt{70 + 11}}$$

$$\sqrt{27 + \sqrt{81}}$$

$$\sqrt{27 + 9}$$

$$\sqrt{36} = 6$$

Q.9. Express the following number as a product of its prime factors:
3825

A $3 \times 5^2 \times 17^3$

B $3^2 \times 5 \times 17$

C $3^2 \times 5^2 \times 17$

D $3^2 \times 5^3 \times 17$

SOLUTION

$$3825 = 3 \times 3 \times 5 \times 5 \times 17$$
$$= 3^2 \times 5^2 \times 17$$

Q.10. Which of the following integers has most number of divisors?

A 176

B 182

C 99

D 101

SOLUTION

If a number has n number of factors, it will have n divisors.
The given numbers are $176, 182, 99, 101.$
$176 = 2^4 \times 11 \Rightarrow 5$ factors
$182 = 2 \times 7 \times 13 \Rightarrow 3$ factors
$99 = 3 \times 3 \times 11 \Rightarrow 3$ factors
$101 = 1 \times 101 \Rightarrow 1$ factor
$\therefore 176$ has greatest number of factors.