



CREST Mathematics Olympiad (CMO) Worksheet *for* Class 6



Topic

Knowing Our Numbers



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Worksheet on Knowing Our Numbers

1. If p and q are two co-primes, what is their lowest common multiple?

- a. $q + p$
- b. $q - p$
- c. $q \times p$
- d. $q \div p$

2. Which of the following numbers is divisible by 21?

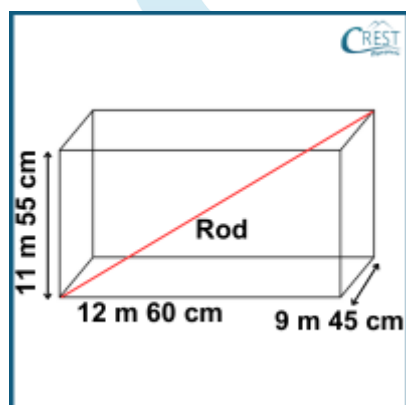
- a. 27604
- b. 27804
- c. 27894
- d. 27904

3. Identify the suitable law for this identity:

$$5013 \times 5031 - 5013 \times 5103 = 5013 \times (5031 - 5103)$$

- a. Distributive Law of Addition over Multiplication.
- b. Distributive Law of Subtraction over Multiplication.
- c. Distributive Law of Multiplication over Addition.
- d. Distributive Law of Multiplication over Subtraction.

4. The dimensions of a room are 12 m 60 cm, 9 m 45 cm and 11 m 55 cm, respectively. What is the longest rod that can measure precisely three dimensions of a room?



- a. 1 m 5 cm
- b. 1 m 50 cm
- c. 10 m 5 cm
- d. 10 m 50 cm

5. Four bells will start tolling together at intervals of 15 minutes, 21 minutes, 5 minutes and 30 minutes, respectively. After how many seconds do they toll together?



- a. 12000 seconds
- b. 12200 seconds
- c. 12400 seconds
- d. 12600 seconds

Answer Key

1. c - $q \times p$

Explanation: The LCM of the co-prime numbers is the product of these two numbers.
Hence, $\text{LCM}(p, q) = p \times q = q \times p$

2. b - 27804

Explanation: To divide the number by 21, it must be divisible by 3 and 7.

Divisibility by 3: To check divisibility by 3, find the sum of its digits to check divisibility.

- a) Sum of digits of the number 27604
 $= 2 + 7 + 6 + 0 + 4 = 19$, which is not divisible by 3
 - b) Sum of digits of the number 27804
 $= 2 + 7 + 8 + 0 + 4 = 21$, which is divisible by 3
 - c) Sum of digits of the number 27894
 $= 2 + 7 + 8 + 9 + 4 = 30$, which is divisible by 3
 - d) Sum of digits of the number 27904
 $= 2 + 7 + 9 + 0 + 4 = 22$, which is not divisible by 3
- Hence, the numbers 27804 and 27894 are divisible by 3.

Divisibility by 7: To check divisibility by 7, double the last digit and subtract the result from the remaining part of the number to check divisibility.

- a) 27604: $2760 - (2 \times 4) = 2752$ which is not divisible by 7.
 - b) 27804: $2780 - (2 \times 4) = 2772$ which is divisible by 7.
 - c) 27894: $2789 - (2 \times 4) = 2781$ which is not divisible by 7.
 - d) 27904: $2790 - (2 \times 4) = 2782$ which is not divisible by 7.
- Hence, the number 27804 is divisible by 7.

Therefore, 27804 is divisible by both 3 and 7. Hence, 27804 is divisible by 21.

3. d - Distributive Law of Multiplication over Subtraction.

Explanation: The distributive law of Multiplication over Subtraction states that:

If A, B and C are three whole numbers, then

$$A \times (B - C) = (A \times B) - (A \times C)$$

Hence, the suitable law for this identity is the distributive law of Multiplication over Subtraction.

$$5013 \times (5031 - 5103) = 5013 \times 5031 - 5013 \times 5103$$

OR

$$5013 \times 5031 - 5013 \times 5103 = 5013 \times (5031 - 5103)$$

4. a - 1 m 5 cm

Explanation: The dimensions of the room are:

$$\text{Length} = 12 \text{ m } 60 \text{ cm} = 12 \text{ m} + 60 \text{ cm} = (12 \times 100) \text{ cm} + 60 \text{ cm} = 1260 \text{ cm}$$

$$\text{Breadth} = 9 \text{ m } 45 \text{ cm} = 9 \text{ m} + 45 \text{ cm} = (9 \times 100) \text{ cm} + 45 \text{ cm} = 945 \text{ cm}$$

$$\text{Height} = 11 \text{ m } 55 \text{ cm} = 11 \text{ m} + 55 \text{ cm} = (11 \times 100) \text{ cm} + 55 \text{ cm} = 1155 \text{ cm}$$

Thus, the longest rod that can measure precisely three dimensions of a room is HCF of 1260, 945 and 1155.

Using prime factorization,

$$1260 = 2 \times 2 \times 3 \times 3 \times 5 \times 7$$

$$945 = 3 \times 3 \times 3 \times 5 \times 7$$

$$1155 = 3 \times 5 \times 7 \times 11$$

$$\text{HCF}(1260, 945, 1155) = 3 \times 5 \times 7 = 105$$

Longest rod that can measure the dimensions of the room exactly

$$\text{HCF}(1260, 945, 1155) = 105 \text{ cm}$$

$$= 100 \text{ cm} + 5 \text{ cm}$$

$$= 1 \text{ m } 5 \text{ cm}$$

5. d - 12600 seconds

Explanation: To find the bells toll together, we should find LCM.

3	15, 21, 5, 30
5	5, 7, 5, 10
	1, 7, 1, 2

$\text{LCM} = 3 \times 5 \times 1 \times 7 \times 1 \times 2 = 210$

Time after which bells will toll together = LCM (15, 21, 5, 30)

$$= 210 \text{ minutes}$$

$$= 210 \times 60 \text{ seconds}$$

$$= 12600 \text{ seconds}$$

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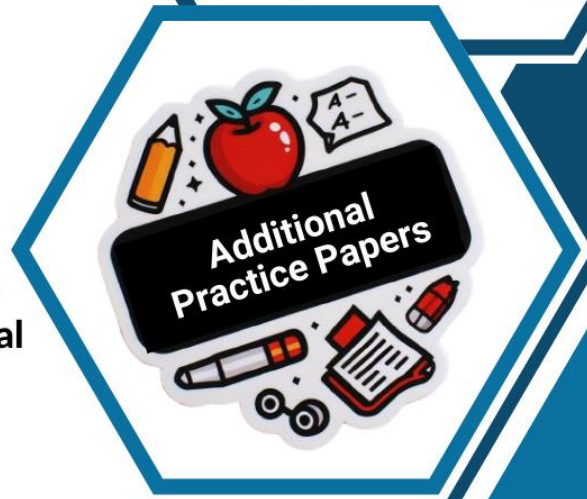
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