



CREST Mathematics Olympiad (CMO) Worksheet *for*

Class 8



Topic

Squares and Cubes



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Worksheet on Squares and Cubes

1. What is the least number that must be subtracted from 2405 to make it a perfect square?
 - a. 2
 - b. 4
 - c. 5
 - d. 7

2. If the Pythagorean triple of one member is 18, what are the other two members?
 - a. 80 and 81
 - b. 81 and 82
 - c. 82 and 81
 - d. 82 and 80

3. If $\sqrt{2} = 1.4$ and $\sqrt{3} = 1.7$, then what is the value of $\sqrt{216}$?
 - a. 12.28
 - b. 14.28
 - c. 16.28
 - d. 18.28

4. Find the smallest number by which 333396 may be divided so that the quotient is a perfect cube.
 - a. 16
 - b. 26
 - c. 36
 - d. 46

5. What is the side of a cube in centimetres whose volume is 57066625 mm^3 ?
 - a. 0.385 cm
 - b. 3.85 cm
 - c. 38.5 cm
 - d. 385 cm

Answer Key

1. b - 4

Explanation: Using long division method to find the square root,

The diagram shows the long division method for finding the square root of 2405. The quotient is 49, and the remainder is 4. The steps are as follows:

	49	
4	2405	
+ 4	- 16	
89	805	
+ 9	- 801	
98	4	Remainder

Taking square root,

Quotient = 49

Perfect Square: $49^2 = 49 \times 49$
 $= 2401$

Remainder = 4

So, 4 is to be subtracted from 2405.

2. d - 82 and 80

Explanation: Pythagorean triplets is given by the formula:

$2m, m^2 + 1, m^2 - 1$ for any number $m > 1$

Let $2m = 18$

$\Rightarrow m = 9$

Therefore, $m^2 + 1 = 9^2 + 1$
 $= 81 + 1$
 $= 82$

$m^2 - 1 = 9^2 - 1$
 $= 81 - 1$
 $= 80$

Hence, the other two members are 80 and 82.

3. b - 14.28

Explanation: $\sqrt{216} = \sqrt{(2 \times 2 \times 2 \times 3 \times 3 \times 3)}$
 $= 2 \times 3 \times \sqrt{(2 \times 3)}$
 $= 6 \times \sqrt{2} \times \sqrt{3}$
 $= 6 \times 1.4 \times 1.7$
 $= 14.28$

4. c - 36

Explanation: Using prime factorisation method to find the cube root,



3	333396
3	111132
3	37044
3	12348
3	4116
7	1372
7	196
7	28
2	4
2	2
	1

Prime factors of 333396 = $3 \times 3 \times 3 \times 3 \times 3 \times 7 \times 7 \times 7 \times 2 \times 2$
= $(3 \times 3 \times 3) \times (7 \times 7 \times 7) \times 3 \times 3 \times 2 \times 2$
Clearly, 333396 must be divided by $(3 \times 3 \times 2 \times 2)$
= 9×4
= 36

5. b - 3.85 cm

Explanation: Volume of a cube = 57066625 mm^3

$$\Rightarrow (\text{Side})^3 = 57066625 \text{ mm}^3$$

$$\Rightarrow \text{Side} = \sqrt[3]{57066625}$$

5	57066625
5	11413325
5	2282665
7	456533
7	65219
7	9317
11	1331
11	121
11	11
	1

$\sqrt[3]{57066625}$

$= \sqrt[3]{5^3 \times 7^3 \times 11^3}$

$= 5 \times 7 \times 11 = 385$

$$\Rightarrow \text{Side of a cube} = 385 \text{ mm}$$

$$\Rightarrow \text{Side of a cube} = 385/10 \text{ cm} [1 \text{ mm} = 1/10 \text{ cm}]$$

$$\text{Side of a cube} = 3.85 \text{ cm}$$

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