

CUBES AND CUBE ROOTS PERIOD 1

SUBJECT : MATHEMATICS CHAPTER NUMBER: 4 CHAPTER NAME : CUBES AND CUBE ROOTS

CHANGING YOUR TOMORROW

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Learning outcome

□ Students will be able to about properties of cubes



Introduction

- A perfect cube is a number which is equal to the number, multiplied by itself, three times.
- If x is a perfect cube of y, then $x = y^3$.
- Ex: Is the number 600 a perfect cube?

Sol: 600 = 2 x2 x 2 x3 x5 x 5 = 2³ x 3 x 5²

The number 600 is not a perfect cube as all the prime factors is not a multiple of three.



Introduction to perfect cubes

https://www.youtube.com/watch?v=tWVGLSznWTs(0:37)



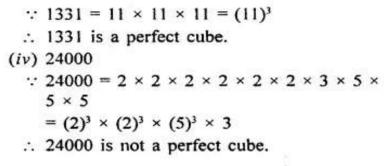
Evaluation Questions

Exercise-4(A)

- 1.(ii) Find the cube of 11.
- Sol: 11 ³ = 11 x 11 x11 = 1331
- 2. (iii) Is 1331 a perfect cube?
 - Sol: 1331 = 11 x 11 x11 = 11 ³
 - ∴1331 is a perfect cube.



Exercise-4(A)



(v) 1728

 $2 | 1728 \\
2 | 864 \\
2 | 432 \\
2 | 216 \\
2 | 108 \\
2 | 54 \\
3 | 27 \\
3 | 9 \\
3 | 3 \\
1$ $\therefore 1728 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$

$$= (2)^3 \times (2)^3 \times (3)^3$$

: 1728 is a perfect cube.



$$(i) \ 2.1 = (2.1)^3 = \left(\frac{21}{10}\right)^3 = \frac{21 \times 21 \times 21}{10 \times 10 \times 10}$$
$$= \frac{9261}{1000} = 9.261$$
$$(ii) \ 0.4 = (0.4)^3 = \left(\frac{4}{10}\right)^3 = \frac{4 \times 4 \times 4}{10 \times 10 \times 10}$$
$$= \frac{64}{1000} = 0.064$$
$$(iii) \ 1.6 = (1.6)^3 = \left(\frac{16}{10}\right)^3 = \frac{16 \times 16 \times 16}{10 \times 10 \times 10}$$
$$= \frac{4096}{1000} = 4.096$$
$$(iv) \ 2.5 = (2.5)^3 = \left(\frac{25}{10}\right)^3 = \frac{25 \times 25 \times 25}{10 \times 10 \times 10}$$
$$= \frac{15625}{1000} = 15.625$$



3)

$$(i) \ \frac{3}{7} = \left(\frac{3}{7}\right)^3 = \frac{3 \times 3 \times 3}{7 \times 7 \times 7} = \frac{27}{343}$$
$$(ii) \ \frac{8}{9} = \left(\frac{8}{9}\right)^3 = \frac{8 \times 8 \times 8}{9 \times 9 \times 9} = \frac{512}{729}$$
$$(iii) \ \frac{10}{13} = \left(\frac{10}{13}\right)^3 = \frac{10 \times 10 \times 10}{13 \times 13 \times 13} = \frac{1000}{2197}$$
$$(iv) \ 1\frac{2}{7} = \left(1\frac{2}{7}\right)^3 = \left(\frac{1 \times 7 + 2}{7}\right)^3 = \left(\frac{9}{7}\right)^3$$
$$= \frac{9 \times 9 \times 9}{7 \times 7 \times 7} = \frac{729}{343} = 2\frac{43}{343}$$
$$(v) \ 2\frac{1}{2} = \left(2\frac{1}{2}\right)^3 = \left(\frac{5}{2}\right)^3$$
$$= \frac{5 \times 5 \times 5}{2 \times 2 \times 2} = \frac{125}{8} = 15\frac{5}{8}.$$



4)

$$(i) -3 = (-3)^3 = -3 \times -3 \times -3$$

= -(3 × 3 × 3) = -27
$$(ii) -7 = (-7)^3 = -7 \times -7 \times -7$$

= -(7 × 7 × 7) = -343
$$(iii) -12 = (-12)^3 = -12 \times -12 \times -12$$

= -(12 × 12 × 12) = -1728
$$(iv) -18 = (-18)^3 = -18 \times -18 \times -18$$

= -(18 × 18 × 18) = -5832
$$(v) -25 = (-25)^3 = -25 \times -25 \times -25$$

= -(25 × 25 × 25) = -15625
$$(vi) -30 = (-30)^3 = -30 \times -30 \times -30$$

= -(30 × 30 × 30) = -27000
$$(vii) -50 = (-50)^3 = -50 \times -50 \times -50$$

= -(50 × 50 × 50) = -125000



Home assignment

Exercise 4(A) - Q No 1 to 5

AHA

- 1. By what smallest number should 3600 be multiplied, so that the quotient is a perfect cube. Also, find the cube root of the quotient.
- 2. If one side of a cube is 15m in Length, then find its volume



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