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CUBES AND CUBE ROOTS

PERIOD 1

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

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Learning outcome

- Students will be able to about properties of cubes

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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 = 2^3 x 3 x 5^2

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

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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: $11^3 = 11 \times 11 \times 11 = 1331$

2. (iii) Is 1331 a perfect cube?

Sol: $1331 = 11 \times 11 \times 11 = 11^3$

$\therefore$1331 is a perfect cube.

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Exercise-4(A)

2)

$\because$ $1331 = 11 \times 11 \times 11 = (11)^3$

$\therefore$ 1331 is a perfect cube.

(*iv*) 24000

$\because$ $24000 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 5$

$= (2)^3 \times (2)^3 \times (5)^3 \times 3$

$\therefore$ 24000 is not a perfect cube.

(*v*) 1728

2	1728
2	864
2	432
2	216
2	108
2	54
3	27
3	9
3	3
	1

$\because$ $1728 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$

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

$\therefore$ 1728 is a perfect cube.

3)

$$(i)\ 2.1 = (2.1)^3 = \left(\frac{21}{10}\right)^3 = \frac{21\times21\times21}{10\times10\times10}$$

$$= \frac{9261}{1000} = 9.261$$

$$(ii)\ 0.4 = (0.4)^3 = \left(\frac{4}{10}\right)^3 = \frac{4\times4\times4}{10\times10\times10}$$

$$= \frac{64}{1000} = 0.064$$

$$(iii)\ 1.6 = (1.6)^3 = \left(\frac{16}{10}\right)^3 = \frac{16\times16\times16}{10\times10\times10}$$

$$= \frac{4096}{1000} = 4.096$$

$$(iv)\ 2.5 = (2.5)^3 = \left(\frac{25}{10}\right)^3 = \frac{25\times25\times25}{10\times10\times10}$$

$$= \frac{15625}{1000} = 15.625$$

4)

$$(i)\ \frac{3}{7} = \left(\frac{3}{7}\right)^3 = \frac{3\times3\times3}{7\times7\times7} = \frac{27}{343}$$

$$(ii)\ \frac{8}{9} = \left(\frac{8}{9}\right)^3 = \frac{8\times8\times8}{9\times9\times9} = \frac{512}{729}$$

$$(iii)\ \frac{10}{13} = \left(\frac{10}{13}\right)^3 = \frac{10\times10\times10}{13\times13\times13} = \frac{1000}{2197}$$

$$(iv)\ 1\frac{2}{7} = \left(1\frac{2}{7}\right)^3 = \left(\frac{1\times7+2}{7}\right)^3 = \left(\frac{9}{7}\right)^3$$

$$= \frac{9\times9\times9}{7\times7\times7} = \frac{729}{343} = 2\frac{43}{343}$$

$$(v)\ 2\frac{1}{2} = \left(2\frac{1}{2}\right)^3 = \left(\frac{5}{2}\right)^3$$

$$= \frac{5\times5\times5}{2\times2\times2} = \frac{125}{8} = 15\frac{5}{8}.$$

5)

$(i)\ -3 = (-3)^3 = -3 \times -3 \times -3$
$= -(3 \times 3 \times 3) = -27$

$(ii)\ -7 = (-7)^3 = -7 \times -7 \times -7$
$= -(7 \times 7 \times 7) = -343$

$(iii)\ -12 = (-12)^3 = -12 \times -12 \times -12$
$= -(12 \times 12 \times 12) = -1728$

$(iv)\ -18 = (-18)^3 = -18 \times -18 \times -18$
$= -(18 \times 18 \times 18) = -5832$

$(v)\ -25 = (-25)^3 = -25 \times -25 \times -25$
$= -(25 \times 25 \times 25) = -15625$

$(vi)\ -30 = (-30)^3 = -30 \times -30 \times -30$
$= -(30 \times 30 \times 30) = -27000$

$(vii)\ -50 = (-50)^3 = -50 \times -50 \times -50$
$= -(50 \times 50 \times 50) = -125000$

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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THANKING YOU

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