

Cubes and Cube Roots

Question Paper, Set 07

Time: 1 hour 30 minutes

Maximum marks: 50

Name: _____ Class: _____ Date: _____

1. Answer all 20 questions. The marks for each question are shown in brackets.
2. Show your working for the 2, 3 and 5 mark questions.
3. The key sheet and worked solutions are at the end of this paper.

1. Write n^3 in words. [1 mark]
2. Write $b \times b \times b \times c \times c \times c$ using cubes. [2 marks]
3. Write the value of 3^3 from the table of cubes. [1 mark]
4. 600 lies between the cubes of which two consecutive numbers? [2 marks]
5. Which of these numbers are cubes? Write each cube as the cube of a number: 8, 16, 216, 400, 512. [3 marks]
6. Find the value of 13^3 . [2 marks]
7. Asha wrote $16^3 = 16 \times 16 = 256$. (i) What mistake did she make? (ii) Find the correct value of 16^3 by first finding 16×16 . (iii) In the same way, find 11^3 . [5 marks]
8. Is $(-25)^3$ a positive or a negative number? Explain without finding its value. [1 mark]
9. Find the values of $(-7)^3$ and $(-9)^3$. [2 marks]
10. Find the cubes of -8 , -10 and -12 . [3 marks]
11. Find $2^3 + 7^3$. [1 mark]
12. Find the sum of the cubes of the first 6 natural numbers. [5 marks]
13. Find $9^3 + (-9)^3$. [1 mark]
14. Find the value of $5^3 + (-8)^3$. [2 marks]
15. How much more is the cube of 10 than the cube of 7? [2 marks]
16. Find the value of $11^3 - 13^3$. [3 marks]
17. Kiran wrote: $11^3 - 14^3 = (11 - 14)^3 = (-3)^3 = -27$. (i) Find the correct value of $11^3 - 14^3$. (ii) What was Kiran's mistake? [5 marks]
18. Simplify $t^3 - (-t)^3$. [1 mark]

19. Arrange in ascending order: $(-4)^3, 3^3, -2^3, (-5)^3, 1^3$. [3 marks]

20. Simplify $-6^3 + (-2)^3 - (-5)^3 + 3^3$. [5 marks]

Key sheet

Q	Answer
1	n power 3 (or) n cubed
2	$b^3 \times c^3$
3	27
4	Between 8^3 and 9^3
5	$8 = 2^3$, $216 = 6^3$, $512 = 8^3$
6	2197
7	(ii) $16^3 = 4096$ (iii) $11^3 = 1331$
8	Negative
9	$(-7)^3 = -343$, $(-9)^3 = -729$
10	$(-8)^3 = -512$, $(-10)^3 = -1000$, $(-12)^3 = -1728$
11	351
12	441
13	0
14	-387
15	657
16	-866
17	(i) -1413 (ii) He subtracted the numbers before cubing them
18	$2t^3$
19	$(-5)^3$, $(-4)^3$, -2^3 , 1^3 , 3^3
20	-72

Solutions

1. Write n^3 in words. [1]

$$n^3 = n \times n \times n$$

It is read as 'n power 3' (or) 'n cubed'.

Ans: n power 3 (or) n cubed

2. Write $b \times b \times b \times c \times c \times c$ using cubes. [2]

$$b \times b \times b = b^3$$

$$c \times c \times c = c^3$$

$$\therefore b \times b \times b \times c \times c \times c = b^3 \times c^3$$

Ans: $b^3 \times c^3$

3. Write the value of 3^3 from the table of cubes. [1]

$$3^3 = 3 \times 3 \times 3$$

$$= 9 \times 3 = 27$$

Ans: 27

4. 600 lies between the cubes of which two consecutive numbers? [2]

From the table: $8^3 = 512$ and $9^3 = 729$.

$$512 < 600 < 729$$

So 600 lies between 8^3 and 9^3 .

Ans: Between 8^3 and 9^3

5. Which of these numbers are cubes? Write each cube as the cube of a number: 8, 16, 216, 400, 512. [3]

Check each number with the table of cubes.

$$2^3 = 8$$

$$6^3 = 216$$

$$8^3 = 512$$

The other numbers are not in the table of cubes, so they are not cubes.

Ans: $8 = 2^3$, $216 = 6^3$, $512 = 8^3$

6. Find the value of 13^3 . [2]

$$13 \times 13 = 169$$

$$13^3 = 169 \times 13 = 2197$$

Ans: 2197

7. Asha wrote $16^3 = 16 \times 16 = 256$. (i) What mistake did she make? (ii) Find the correct value of 16^3 by first finding 16×16 . (iii) In the same way, find 11^3 . [5]

(i) She multiplied 16 by itself only 2 times. 16^3 needs 3 factors of 16.

$$(ii) 16 \times 16 = 256, 256 \times 16 = 4096$$

$$(iii) 11 \times 11 = 121, 121 \times 11 = 1331$$

Ans: (ii) $16^3 = 4096$ (iii) $11^3 = 1331$

8. Is $(-25)^3$ a positive or a negative number? Explain without finding its value. [1]

$$(-25)^3 = -25^3$$

The cube of a negative number is negative.

Ans: Negative

9. Find the values of $(-7)^3$ and $(-9)^3$. [2]

$$(-7)^3 = -7^3 = -343$$

$$9 \times 9 = 81, 81 \times 9 = 729$$

$$\therefore (-9)^3 = -729$$

Ans: $(-7)^3 = -343, (-9)^3 = -729$

10. Find the cubes of -8 , -10 and -12 . [3]

$$(-8)^3 = -8^3 = -(64 \times 8) = -512$$

$$(-10)^3 = -10^3 = -(100 \times 10) = -1000$$

$$(-12)^3 = -12^3 = -(144 \times 12) = -1728$$

Ans: $(-8)^3 = -512, (-10)^3 = -1000, (-12)^3 = -1728$

11. Find $2^3 + 7^3$. [1]

$$2^3 + 7^3 = 8 + 343$$

$$= 351$$

Ans: 351

12. Find the sum of the cubes of the first 6 natural numbers. [5]

$$1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 = 1 + 8 + 27 + 64 + 125 + 216$$

$$= 441$$

Ans: 441

13. Find $9^3 + (-9)^3$. [1]

$$(-9)^3 = -9^3$$

$$9^3 + (-9)^3 = 9^3 - 9^3 = 0$$

Ans: 0

14. Find the value of $5^3 + (-8)^3$. [2]

$$5^3 + (-8)^3 = 125 + (-512)$$

$$= 125 - 512$$

$$= -387$$

Ans: -387

15. How much more is the cube of 10 than the cube of 7? [2]

$$\text{Difference} = 10^3 - 7^3$$

$$10^3 - 7^3 = 1000 - 343$$

$$= 657$$

Ans: 657

16. Find the value of $11^3 - 13^3$. [3]

$$11^3 = 121 \times 11 = 1331$$

$$13^3 = 169 \times 13 = 2197$$

$$11^3 - 13^3 = 1331 - 2197$$

$$= -866$$

Ans: -866

17. Kiran wrote: $11^3 - 14^3 = (11 - 14)^3 = (-3)^3 = -27$. (i) Find the correct value of $11^3 - 14^3$. (ii) What was Kiran's mistake? [5]

(i) $11^3 = 121 \times 11 = 1331$

$$14^3 = 196 \times 14 = 2744$$

$$11^3 - 14^3 = 1331 - 2744 = -1413$$

(ii) Each number must be cubed first and then subtracted. $11^3 - 14^3$ is not $(11 - 14)^3$.

Ans: (i) -1413 (ii) He subtracted the numbers before cubing them

18. Simplify $t^3 - (-t)^3$. [1]

$$(-t)^3 = -t^3$$

$$t^3 - (-t^3) = t^3 + t^3 = 2t^3$$

Ans: $2t^3$

19. Arrange in ascending order: $(-4)^3, 3^3, -2^3, (-5)^3, 1^3$. [3]

$$(-4)^3 = -64, 3^3 = 27, -2^3 = -8, (-5)^3 = -125, 1^3 = 1$$

$$-125 < -64 < -8 < 1 < 27$$

So the order is $(-5)^3, (-4)^3, -2^3, 1^3, 3^3$.

Ans: $(-5)^3, (-4)^3, -2^3, 1^3, 3^3$

20. Simplify $-6^3 + (-2)^3 - (-5)^3 + 3^3$. [5]

$$-6^3 + (-2)^3 - (-5)^3 + 3^3 = -216 + (-8) - (-125) + 27$$

$$= -216 - 8 + 125 + 27$$

$$= -72$$

Ans: -72
