


STUDY
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Chapter End Test
(2019-20)

Date : _____
Duration : 45 Min.
Max. Marks : 25

Mathematics
Topic: Number Systems

Class
IX

Instructions:

- ▶ All questions are compulsory.
- ▶ Section A is comprised of 15 multiple choice questions carrying 1 mark each.
- ▶ Section B is comprised of 3 questions carrying 3, 3 and 4 marks respectively.
- ▶ Use of calculator is not permitted.
- ▶ Objectives of test paper. (i) To assess the conceptual understanding of students. (ii) To make them attempt subjective questions as required in CBSE Board Exam.

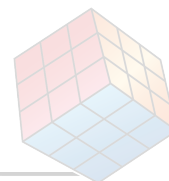
Section - A

1. Rational number $\frac{3}{40}$ is equal to:
(a) 0.75 (b) 0.12 (c) 0.012 (d) 0.075
2. A rational number between $\frac{1}{2}$ and $\frac{3}{4}$ is :
(a) $\frac{2}{5}$ (b) $\frac{5}{8}$ (c) $\frac{4}{3}$ (d) $\frac{1}{4}$
3. Which one of the following is not a rational number?
(a) 0 (b) $\sqrt{2}$ (c) $\sqrt{4}$ (d) $\sqrt{49}$
4. Which of the following is an irrational number?
(a) $\sqrt{4}$ (b) $\sqrt{1000}$ (c) $\sqrt{100}$ (d) $-\sqrt{0.64}$
5. Decimal representation of rational number $\frac{8}{27}$ is:
(a) $0.\overline{296}$ (b) $0.29\overline{6}$ (c) $0.29\overline{6}$ (d) 0.296
6. $0.6666\dots$ in $\frac{p}{q}$ form is:
(a) $\frac{6}{99}$ (b) $\frac{2}{3}$ (c) $\frac{3}{5}$ (d) $\frac{1}{66}$
7. The value of $(3 + \sqrt{3})(3 - \sqrt{3})$ is:
(a) 3 (b) 0 (c) 6 (d) 9
8. On rationalizing the denominator of $\frac{1}{\sqrt{7} - \sqrt{6}}$, we get:
(a) $\frac{\sqrt{7} + \sqrt{6}}{\sqrt{7} - \sqrt{6}}$ (b) $\frac{\sqrt{7} - \sqrt{6}}{\sqrt{7} + \sqrt{6}}$ (c) $\sqrt{7} + \sqrt{6}$ (d) $\sqrt{7} - \sqrt{6}$
9. If $\sqrt{10} = 3.162$, then the value of $\frac{1}{\sqrt{10}}$ is:
(a) 0.3162 (b) 3.162 (c) 31.62 (d) 316.2

10. The value of $64^{\frac{-3}{2}}$ is:
 (a) $\frac{1}{96}$ (b) $\frac{1}{64}$ (c) 512 (d) $\frac{1}{512}$
11. The exponent form of $\sqrt[3]{7}$ is:
 (a) 7^3 (b) 3^7 (c) $7^{\frac{1}{3}}$ (d) $3^{\frac{1}{7}}$
12. Which of the following is true?
 (a) Every whole number is a natural number (b) Every integer is a rational number
 (c) Every rational number is an integer (d) Every integer is a whole number
13. If m and n are two natural numbers and $m^n = 32$, then n^{mn} is:
 (a) 5^2 (b) 5^3 (c) 5^{10} (d) 5^{12}
14. The rationalizing factor of $\frac{4\sqrt{3} + 5\sqrt{2}}{\sqrt{48} + \sqrt{18}}$ is:
 (a) $4\sqrt{3} - 3\sqrt{2}$ (b) $(48 - 18)$
 (c) $4\sqrt{3} + 3\sqrt{2}$ (d) $\sqrt{48} + \sqrt{18}$
15. $\frac{3\sqrt{12}}{6\sqrt{27}}$ equals:
 (a) $\frac{1}{2}$ (b) $\sqrt{2}$ (c) $\sqrt{2}$ (d) $\frac{1}{3}$

Section - B

1. Simplify: $\left[5\left(8^{\frac{1}{3}} + 27^{\frac{1}{3}}\right)^3\right]^{\frac{1}{4}}$.
2. Represent the real number $\sqrt{8.5}$ on the number line.
3. If $x = \frac{\sqrt{2} + 1}{\sqrt{2} - 1}$; $y = \frac{\sqrt{2} - 1}{\sqrt{2} + 1}$, find the value of $x^2 + y^2$.



OR

If a and b be rational numbers and $\frac{2 + \sqrt{3}}{2 - \sqrt{3}} = a + b\sqrt{3}$, find the values of a and b .



Hints/Solutions to Chapter End Test (2019-20)

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Section - A

- | | | | |
|---------|---------|---------|---------|
| 1. (d) | 2. (b) | 3. (b) | 4. (b) |
| 5. (a) | 6. (b) | 7. (c) | 8. (c) |
| 9. (a) | 10. (d) | 11. (c) | 12. (b) |
| 13. (c) | 14. (a) | 15. (d) | |

Section - B

$$1. \left[5 \left(8^{\frac{1}{3}} + 27^{\frac{1}{3}} \right)^3 \right]^{\frac{1}{4}}$$

$$\left[5 \left((2^3)^{\frac{1}{3}} + (3^3)^{\frac{1}{3}} \right)^3 \right]^{\frac{1}{4}}$$

$$\left[5(2+3)^3 \right]^{\frac{1}{4}}$$

$$\left[5(5)^3 \right]^{\frac{1}{4}}$$

$$\left[5^4 \right]^{\frac{1}{4}}$$

$$= 5.$$

$$2. \sqrt{8.5}$$

$$BD = BE = \sqrt{8.5}$$

$$3. x = \frac{\sqrt{2}+1}{\sqrt{2}-1} \text{ and } y = \frac{\sqrt{2}-1}{\sqrt{2}+1}$$

$$x = \frac{\sqrt{2}+1}{\sqrt{2}-1} \times \frac{\sqrt{2}+1}{\sqrt{2}+1} = \frac{(\sqrt{2}+1)^2}{(\sqrt{2})^2 - (1)^2} = 3 + 2\sqrt{2}$$

$$y = \frac{\sqrt{2}-1}{\sqrt{2}+1} \times \frac{\sqrt{2}-1}{\sqrt{2}-1} = \frac{(\sqrt{2}-1)^2}{(\sqrt{2})^2 - (1)^2} = 3 - 2\sqrt{2}$$

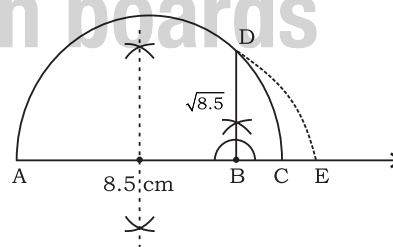
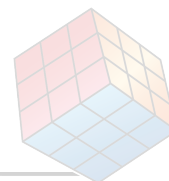
$$x^2 + y^2 = (3 + 2\sqrt{2})^2 + (3 - 2\sqrt{2})^2$$

$$= (9 + 8 + 12\sqrt{2}) + (9 + 8 - 12\sqrt{2})$$

$$= 34.$$

OR

$$\frac{2 + \sqrt{3}}{2 - \sqrt{3}} = a + b\sqrt{3}$$



$$\Rightarrow \frac{2+\sqrt{3}}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}} = a + b\sqrt{3}$$

$$\Rightarrow \frac{(2+\sqrt{3})^2}{(2)^2 - (\sqrt{3})^2} = a + b\sqrt{3}$$

$$\Rightarrow \frac{4+3+4\sqrt{3}}{4-3} = a + b\sqrt{3}$$

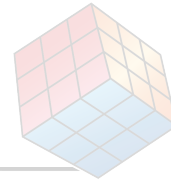
$$\Rightarrow 7 + 4\sqrt{3} = a + b\sqrt{3}$$

On comparing both side, we get

$a = 7$ and $b = 3$.



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