

Real Numbers and their Properties

MCQ Test, Set 01

Time: 30 minutes

Maximum marks: 25

Name: _____ Class: _____ Date: _____

- There are 25 questions. Each has exactly one correct answer: choose A, B, C or D.
- Each correct answer carries 1 mark. There is no negative marking.
- The key sheet and worked solutions are at the end of this test.

1. How many integers are there between -1 and 3 ?

- A.** 5 **B.** 3 **C.** 2 **D.** 4

2. The integers between -7 and -2 are

- A.** $-7, -6, -5, -4, -3, -2$ **B.** $-6, -5, -4, -3, -2$ **C.** $-5, -4, -3$ **D.** $-6, -5, -4, -3$

3. Which of the following is an irrational number?

- A.** 5.8 **B.** $\sqrt{7}$ **C.** $5.\bar{8}$ **D.** $\frac{8}{13}$

4. $\sqrt{24} = 4.8989\dots$ is

- A.** an integer
B. a non terminating non recurring decimal, so irrational
C. a terminating decimal, so rational
D. a non terminating recurring decimal, so rational

5. $\sqrt{13}$ belongs to which of these sets?

- A.** N (natural numbers) **B.** W (whole numbers)
C. Q (rational numbers) **D.** Q^* (irrational numbers)

6. Which of the following is true?

- A.** $e \in Z$ **B.** $0 \in W$ **C.** $\sqrt{54} \in Z$ **D.** $\sqrt{43} \in Q$

7. Add $-10\sqrt{19}$ and $25\sqrt{19}$.

- A.** $15\sqrt{38}$ **B.** $-35\sqrt{19}$ **C.** $-15\sqrt{19}$ **D.** $15\sqrt{19}$

8. Add $-4 - 10\sqrt{19}$ and $-11 + 12\sqrt{19}$.

- A.** $-13\sqrt{19}$ **B.** $7 + 2\sqrt{19}$ **C.** $-15 + 2\sqrt{19}$ **D.** $-15 - 22\sqrt{19}$

9. Subtract $-25\sqrt{10}$ from $-9\sqrt{10}$.

- A.** $16\sqrt{10}$ **B.** $34\sqrt{10}$ **C.** $-34\sqrt{10}$ **D.** $-16\sqrt{10}$

10. Subtract $(8 + 2\sqrt{21})$ from $(9 - 5\sqrt{21})$.
A. $17 - 7\sqrt{21}$ **B.** $1 - 3\sqrt{21}$ **C.** $1 - 7\sqrt{21}$ **D.** $-1 + 7\sqrt{21}$
-
11. $2\sqrt{3} \times (-6\sqrt{10}) =$
A. $-12\sqrt{13}$ **B.** $-12\sqrt{30}$ **C.** $-4\sqrt{30}$ **D.** $12\sqrt{30}$
-
12. $\sqrt{11} \times \sqrt{3} =$
A. 33 **B.** $11\sqrt{3}$ **C.** $\sqrt{33}$ **D.** $\sqrt{14}$
-
13. $-25\sqrt{17} + 14\sqrt{17} + 20\sqrt{17} =$
A. $9\sqrt{17}$ **B.** $8\sqrt{17}$ **C.** $-9\sqrt{17}$ **D.** $59\sqrt{17}$
-
14. $46690\sqrt{3} - 9009\sqrt{3} - 30057\sqrt{3} + 1350\sqrt{3} =$
A. $8974\sqrt{3}$ **B.** $-8974\sqrt{3}$ **C.** $87106\sqrt{3}$ **D.** $8984\sqrt{3}$
-
15. $5\sqrt{162} \times 5\sqrt{32} =$
A. 129600 **B.** 720 **C.** -1800 **D.** 1800
-
16. $-7\sqrt{3} \times 5\sqrt{27} =$
A. 315 **B.** -2835 **C.** -315 **D.** -18
-
17. $\frac{\sqrt{70}}{\sqrt{10}} =$
A. $\sqrt{60}$ **B.** $\sqrt{7}$ **C.** 7 **D.** $\sqrt{700}$
-
18. $\frac{42}{\sqrt{42}} =$
A. $\sqrt{42}$ **B.** 42 **C.** 1 **D.** $42\sqrt{42}$
-
19. $\sqrt{52} =$
A. $2\sqrt{26}$ **B.** $4\sqrt{13}$ **C.** $13\sqrt{2}$ **D.** $2\sqrt{13}$
-
20. $\sqrt{448} + \sqrt{175} =$
A. $13\sqrt{7}$ **B.** $89\sqrt{7}$ **C.** $\sqrt{623}$ **D.** $13\sqrt{14}$
-
21. If $a = 0$ and $b = -22$, which of the following does not belong to R ?
A. $\frac{b}{a}$ **B.** $a \times b$ **C.** $\frac{a}{b}$ **D.** $a + b$
-
22. For $a = 13$ and $b = 17$, which of the following is NOT true?
A. $a + b = b + a$ **B.** $a \times 1 = a$ **C.** $a - b = b - a$ **D.** $a + 0 = a$
-
23. $(-12 \div 6) \div 3 =$
A. -6 **B.** $-\frac{2}{3}$ **C.** -4 **D.** -2
-
24. $22 + \underline{\hspace{1cm}} = 22$. The number in the blank is
A. -22 **B.** 22 **C.** 0 **D.** 1
-

25. The multiplicative inverse of -14 is

A. 14

B. $\frac{1}{14}$

C. 1

D. $-\frac{1}{14}$

Key sheet

1. B	2. D	3. B	4. B	5. D
6. B	7. D	8. C	9. A	10. C
11. B	12. C	13. A	14. A	15. D
16. C	17. B	18. A	19. D	20. A
21. A	22. C	23. B	24. C	25. D

Solutions

1. How many integers are there between -1 and 3 ?

$$\mathbb{Z} = \{\dots, -2, -1, 0, 1, 2, 3, \dots\}$$

The integers between -1 and 3 are $0, 1, 2$, that is 3 numbers.

Ans: (B) 3

2. The integers between -7 and -2 are

$$\mathbb{Z} = \{\dots, -2, -1, 0, 1, 2, 3, \dots\}$$

So the integers between -7 and -2 are $-6, -5, -4, -3$.

Ans: (D) $-6, -5, -4, -3$

3. Which of the following is an irrational number?

$\sqrt{7} = 2.6457\dots$ is a non terminating non recurring decimal, so it is irrational.

The other numbers can be written in the form $\frac{p}{q}$, so they are rational.

Ans: (B) $\sqrt{7}$

4. $\sqrt{24} = 4.8989\dots$ is

$\sqrt{24} = 4.8989\dots$ is a non terminating non recurring decimal, so it is irrational.

Ans: (B) a non terminating non recurring decimal, so irrational

5. $\sqrt{13}$ belongs to which of these sets?

$\sqrt{13} = 3.6055\dots$ is a non terminating non recurring decimal, so it is irrational.

So $\sqrt{13}$ belongs to $\mathbb{Q}^*$; it does not belong to $\mathbb{N}$, $\mathbb{W}$ or $\mathbb{Q}$.

Ans: (D) $\mathbb{Q}^*$ (irrational numbers)

6. Which of the following is true?

$$\mathbb{W} = \{0, 1, 2, 3, 4, \dots\}$$

0 is in this set, so the statement is true.

The other three statements are false.

Ans: (B) $0 \in \mathbb{W}$

7. Add $-10\sqrt{19}$ and $25\sqrt{19}$.

$$\begin{aligned} -10\sqrt{19} + 25\sqrt{19} &= (-10 + 25)\sqrt{19} \\ &= 15\sqrt{19} \end{aligned}$$

Ans: (D) $15\sqrt{19}$

8. Add $-4 - 10\sqrt{19}$ and $-11 + 12\sqrt{19}$.

$$\begin{aligned} -4 - 10\sqrt{19} - 11 + 12\sqrt{19} &= (-4 - 11) + (-10 + 12)\sqrt{19} \\ &= -15 + 2\sqrt{19} \end{aligned}$$

Only like terms are added: numbers with numbers, $\sqrt{19}$ terms with $\sqrt{19}$ terms.

Ans: (C) $-15 + 2\sqrt{19}$

9. Subtract $-25\sqrt{10}$ from $-9\sqrt{10}$.

$$\begin{aligned} -9\sqrt{10} - (-25\sqrt{10}) &= -9\sqrt{10} + 25\sqrt{10} \\ &= 16\sqrt{10} \end{aligned}$$

Ans: (A) $16\sqrt{10}$

10. Subtract $(8 + 2\sqrt{21})$ from $(9 - 5\sqrt{21})$.

$$\begin{aligned} (9 - 5\sqrt{21}) - (8 + 2\sqrt{21}) &= 9 - 5\sqrt{21} - 8 - 2\sqrt{21} \\ &= 1 - 7\sqrt{21} \end{aligned}$$

The sign of every term of the bracket being subtracted changes.

Ans: (C) $1 - 7\sqrt{21}$

11. $2\sqrt{3} \times (-6\sqrt{10}) =$

$$\begin{aligned} 2\sqrt{3} \times (-6\sqrt{10}) &= 2 \times (-6) \times \sqrt{3 \times 10} \\ &= -12\sqrt{30} \end{aligned}$$

Ans: (B) $-12\sqrt{30}$

12. $\sqrt{11} \times \sqrt{3} =$

$$\begin{aligned} \sqrt{a} \times \sqrt{b} &= \sqrt{a \times b} \\ \sqrt{11} \times \sqrt{3} &= \sqrt{33} \end{aligned}$$

Ans: (C) $\sqrt{33}$

13. $-25\sqrt{17} + 14\sqrt{17} + 20\sqrt{17} =$

$$\begin{aligned} -25\sqrt{17} + 14\sqrt{17} + 20\sqrt{17} &= (-25 + 14 + 20)\sqrt{17} \\ &= 9\sqrt{17} \end{aligned}$$

Ans: (A) $9\sqrt{17}$

14. $46690\sqrt{3} - 9009\sqrt{3} - 30057\sqrt{3} + 1350\sqrt{3} =$

$$\text{Positive terms: } 46690\sqrt{3} + 1350\sqrt{3} = 48040\sqrt{3}$$

$$\text{Negative terms: } 9009\sqrt{3} + 30057\sqrt{3} = 39066\sqrt{3}$$

$$\begin{aligned} 46690\sqrt{3} - 9009\sqrt{3} - 30057\sqrt{3} + 1350\sqrt{3} &= 48040\sqrt{3} - 39066\sqrt{3} \\ &= (48040 - 39066)\sqrt{3} = 8974\sqrt{3} \end{aligned}$$

Ans: (A) $8974\sqrt{3}$

15. $5\sqrt{162} \times 5\sqrt{32} =$

$$\begin{aligned} 5\sqrt{162} \times 5\sqrt{32} &= 5 \times 5 \times \sqrt{162 \times 32} \\ &= 25 \times \sqrt{5184} \end{aligned}$$

$$\begin{aligned} \text{Long division: } 7 \times 7 &= 49, \text{ remainder } 2; \text{ bring down } 84 \text{ to get } 284; 142 \times 2 = 284. \text{ So } \sqrt{5184} = 72 \\ &= 25 \times 72 = 1800 \end{aligned}$$

Ans: (D) 1800

16. $-7\sqrt{3} \times 5\sqrt{27} =$

$$\begin{aligned} -7\sqrt{3} \times 5\sqrt{27} &= -7 \times 5 \times \sqrt{3 \times 27} \\ &= -35 \times \sqrt{81} \\ \sqrt{81} &= 9 \\ &= -35 \times 9 = -315 \end{aligned}$$

Ans: (C) -315

17. $\frac{\sqrt{70}}{\sqrt{10}} =$

$$\begin{aligned} \frac{\sqrt{a}}{\sqrt{b}} &= \sqrt{\frac{a}{b}} \\ \frac{\sqrt{70}}{\sqrt{10}} &= \sqrt{7} \end{aligned}$$

Ans: (B) $\sqrt{7}$

18. $\frac{42}{\sqrt{42}} =$

$$\begin{aligned} \frac{a}{\sqrt{a}} &= \frac{\sqrt{a} \times \sqrt{a}}{\sqrt{a}} = \sqrt{a} \\ \frac{42}{\sqrt{42}} &= \sqrt{42} \end{aligned}$$

Ans: (A) $\sqrt{42}$

19. $\sqrt{52} =$

$$\sqrt{52} = \sqrt{4 \times 13} = \sqrt{4} \times \sqrt{13} = 2\sqrt{13}$$

Ans: (D) $2\sqrt{13}$

20. $\sqrt{448} + \sqrt{175} =$

$$\begin{aligned} \sqrt{448} &= \sqrt{64 \times 7} = \sqrt{64} \times \sqrt{7} = 8\sqrt{7} \\ \sqrt{175} &= \sqrt{25 \times 7} = \sqrt{25} \times \sqrt{7} = 5\sqrt{7} \\ 8\sqrt{7} + 5\sqrt{7} &= 13\sqrt{7} \end{aligned}$$

Ans: (A) $13\sqrt{7}$

21. If $a = 0$ and $b = -22$, which of the following does not belong to R ?

$$\begin{aligned} \frac{b}{a} &= \frac{-22}{0} \text{ is not defined, so it does not belong to } R. \\ \frac{a}{b} &= \frac{0}{-22} = 0 \in R. \end{aligned}$$

Ans: (A) $\frac{b}{a}$

22. For $a = 13$ and $b = 17$, which of the following is NOT true?

$$\begin{aligned} a - b &= 13 - 17 = -4, b - a = 17 - 13 = 4 \\ \text{So } a - b &\neq b - a. \end{aligned}$$

Ans: (C) $a - b = b - a$

23. $(-12 \div 6) \div 3 =$

$$(-12 \div 6) \div 3 = -2 \div 3 = -\frac{2}{3}$$

Do the bracket first. Division is not associative, so $-12 \div (6 \div 3) = -6$ is different.

Ans: (B) $-\frac{2}{3}$

24. $22 + \underline{\hspace{1cm}} = 22$. The number in the blank is

$a + 0 = a$: 0 is the additive identity.

Ans: (C) 0

25. The multiplicative inverse of -14 is

Multiplicative inverse of a is $\frac{1}{a}$, since $a \times \frac{1}{a} = 1$.

$$-14 \times \left(-\frac{1}{14}\right) = 1$$

Ans: (D) $-\frac{1}{14}$
