

Real Numbers and their Properties

MCQ Test, Set 04

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 -12 and -6 ?

- A.** 4 **B.** 7 **C.** 6 **D.** 5

2. The natural numbers between -1 and 5 are

- A.** 1, 2, 3, 4 **B.** 1, 2, 3, 4, 5 **C.** 0, 1, 2, 3, 4 **D.** 2, 3, 4

3. Which of these numbers is rational?

- A.** π **B.** $\sqrt{24}$ **C.** $\sqrt{169}$ **D.** $\sqrt{29}$

4. $\sqrt{76} = 8.7177\dots$ is

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

5. -28 belongs to which of these sets?

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

6. Which statement is correct?

- A.** $\pi \in N$ **B.** $3.\bar{2} \in Q$ **C.** $\sqrt{27} \in Q$ **D.** $\sqrt{20} \in Z$

7. Add $-18\sqrt{10}$ and $-24\sqrt{10}$.

- A.** $42\sqrt{10}$ **B.** $-42\sqrt{10}$ **C.** $6\sqrt{10}$ **D.** $-42\sqrt{20}$

8. Add $4\sqrt{10} - \sqrt{15}$ and $10\sqrt{10} + 3\sqrt{15}$.

- A.** $14\sqrt{10} + 4\sqrt{15}$ **B.** $-6\sqrt{10} + 2\sqrt{15}$ **C.** $14\sqrt{10} + 2\sqrt{15}$ **D.** $14\sqrt{10} - 2\sqrt{15}$

9. Subtract $(11 - \sqrt{14})$ from $(11 + \sqrt{14})$.

- A.** 0 **B.** 22 **C.** $-2\sqrt{14}$ **D.** $2\sqrt{14}$

10. Subtract $12\sqrt{15}$ from $-2\sqrt{15}$.

- A.** $-14\sqrt{15}$ **B.** $14\sqrt{15}$ **C.** $10\sqrt{15}$ **D.** $-10\sqrt{15}$

11. $6\sqrt{10} \times (-2\sqrt{10}) =$
A. $-12\sqrt{10}$ **B.** 40 **C.** -120 **D.** 120
-
12. $2\sqrt{13} \times (-8\sqrt{3}) =$
A. -624 **B.** $-6\sqrt{39}$ **C.** $16\sqrt{39}$ **D.** $-16\sqrt{39}$
-
13. $26\sqrt{10} - 8\sqrt{10} - 3\sqrt{10} =$
A. $14\sqrt{10}$ **B.** $37\sqrt{10}$ **C.** $-15\sqrt{10}$ **D.** $15\sqrt{10}$
-
14. $-8377\sqrt{14} + 95809\sqrt{14} - 24315\sqrt{14} + 10639\sqrt{14} =$
A. $-73756\sqrt{14}$ **B.** $73856\sqrt{14}$ **C.** $73756\sqrt{14}$ **D.** $139140\sqrt{14}$
-
15. $-6\sqrt{108} \times (-4\sqrt{12}) =$
A. -864 **B.** 864 **C.** -360 **D.** 31104
-
16. $7\sqrt{216} \times 7\sqrt{6} =$
A. -1764 **B.** 1764 **C.** 63504 **D.** 504
-
17. $\frac{\sqrt{108}}{3\sqrt{3}} =$
A. 2 **B.** 6 **C.** 3 **D.** 12
-
18. $\frac{3 \times \sqrt{361}}{\sqrt{19}} =$
A. $\sqrt{361}$ **B.** $\sqrt{19}$ **C.** 57 **D.** $3\sqrt{19}$
-
19. $\sqrt{325} =$
A. $5\sqrt{13}$ **B.** $13\sqrt{5}$ **C.** $5\sqrt{65}$ **D.** $25\sqrt{13}$
-
20. $\sqrt{252} + \sqrt{112} =$
A. $10\sqrt{7}$ **B.** $52\sqrt{7}$ **C.** $\sqrt{364}$ **D.** $10\sqrt{14}$
-
21. Real numbers are not closed under
A. multiplication **B.** division
C. subtraction **D.** addition
-
22. For $a = -19$ and $b = -7$, which of the following is NOT true?
A. $a \times b = b \times a$ **B.** $a + b = b + a$ **C.** $a + 0 = a$ **D.** $a - b = b - a$
-
23. $11 \times (8 \times (-\frac{11}{5})) = (11 \times 8) \times (-\frac{11}{5})$ shows the
A. commutative property under multiplication
B. closure under multiplication
C. associative property under multiplication
D. multiplicative identity
-
24. The additive identity of real numbers is
A. $-a$ **B.** 0 **C.** 1 **D.** $\frac{1}{a}$
-

25. The additive inverse of 29 is

A. 0

B. -29

C. $-\frac{1}{29}$

D. $\frac{1}{29}$

Key sheet

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

Solutions

1. How many integers are there between -12 and -6 ?

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

The integers between -12 and -6 are $-11, -10, -9, -8, -7$, that is 5 numbers.

Ans: (D) 5

2. The natural numbers between -1 and 5 are

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

So the natural numbers between -1 and 5 are $1, 2, 3, 4$.

Ans: (A) 1, 2, 3, 4

3. Which of these numbers is rational?

$$\sqrt{169} = 13 = \frac{13}{1}, \text{ so it is rational.}$$

The other numbers are non terminating non recurring decimals, so they are irrational.

Ans: (C) $\sqrt{169}$

4. $\sqrt{76} = 8.7177\dots$ is

$\sqrt{76} = 8.7177\dots$ is a non terminating non recurring decimal, so it is irrational.

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

5. -28 belongs to which of these sets?

So -28 belongs to $\mathbb{Z}$; it does not belong to $\mathbb{N}$, $\mathbb{Q}^*$ or $\mathbb{W}$.

Ans: (C) $\mathbb{Z}$ (integers)

6. Which statement is correct?

$3.\overline{2}$ is a non terminating recurring decimal, so it is rational.

$$\mathbb{Q} = \left\{ \frac{p}{q} \text{ where } p, q \text{ are integers and } q \neq 0 \right\}$$

$3.\overline{2}$ can be written in the form $\frac{p}{q}$, so the statement is true.

The other three statements are false.

Ans: (B) $3.\overline{2} \in \mathbb{Q}$

7. Add $-18\sqrt{10}$ and $-24\sqrt{10}$.

$$\begin{aligned} -18\sqrt{10} - 24\sqrt{10} &= (-18 - 24)\sqrt{10} \\ &= -42\sqrt{10} \end{aligned}$$

Ans: (B) $-42\sqrt{10}$

8. Add $4\sqrt{10} - \sqrt{15}$ and $10\sqrt{10} + 3\sqrt{15}$.

$$\begin{aligned} 4\sqrt{10} - \sqrt{15} + 10\sqrt{10} + 3\sqrt{15} &= (4 + 10)\sqrt{10} + (-1 + 3)\sqrt{15} \\ &= 14\sqrt{10} + 2\sqrt{15} \end{aligned}$$

Ans: (C) $14\sqrt{10} + 2\sqrt{15}$

9. Subtract $(11 - \sqrt{14})$ from $(11 + \sqrt{14})$.

$$(11 + \sqrt{14}) - (11 - \sqrt{14}) = 11 + \sqrt{14} - 11 + \sqrt{14} \\ = 2\sqrt{14}$$

Ans: (D) $2\sqrt{14}$

10. Subtract $12\sqrt{15}$ from $-2\sqrt{15}$.

$$-2\sqrt{15} - (12\sqrt{15}) = -2\sqrt{15} - 12\sqrt{15} \\ = -14\sqrt{15}$$

Ans: (A) $-14\sqrt{15}$

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

$$6\sqrt{10} \times (-2\sqrt{10}) = 6 \times (-2) \times \sqrt{10} \times \sqrt{10} \\ = -12 \times 10 = -120 \text{ (since } \sqrt{a} \times \sqrt{a} = a \text{)}$$

Ans: (C) -120

12. $2\sqrt{13} \times (-8\sqrt{3}) =$

$$2\sqrt{13} \times (-8\sqrt{3}) = 2 \times (-8) \times \sqrt{13 \times 3} \\ = -16\sqrt{39}$$

Ans: (D) $-16\sqrt{39}$

13. $26\sqrt{10} - 8\sqrt{10} - 3\sqrt{10} =$

$$26\sqrt{10} - 8\sqrt{10} - 3\sqrt{10} = (26 - 8 - 3)\sqrt{10} \\ = 15\sqrt{10}$$

Ans: (D) $15\sqrt{10}$

14. $-8377\sqrt{14} + 95809\sqrt{14} - 24315\sqrt{14} + 10639\sqrt{14} =$

$$\text{Positive terms: } 95809\sqrt{14} + 10639\sqrt{14} = 106448\sqrt{14}$$

$$\text{Negative terms: } 8377\sqrt{14} + 24315\sqrt{14} = 32692\sqrt{14}$$

$$-8377\sqrt{14} + 95809\sqrt{14} - 24315\sqrt{14} + 10639\sqrt{14} = 106448\sqrt{14} - 32692\sqrt{14} \\ = (106448 - 32692)\sqrt{14} = 73756\sqrt{14}$$

Ans: (C) $73756\sqrt{14}$

15. $-6\sqrt{108} \times (-4\sqrt{12}) =$

$$-6\sqrt{108} \times (-4\sqrt{12}) = -6 \times (-4) \times \sqrt{108 \times 12} \\ = 24 \times \sqrt{1296}$$

$$\text{Long division: } 3 \times 3 = 9, \text{ remainder } 3; \text{ bring down } 96 \text{ to get } 396; 66 \times 6 = 396. \text{ So } \sqrt{1296} = 36 \\ = 24 \times 36 = 864$$

Ans: (B) 864

16. $7\sqrt{216} \times 7\sqrt{6} =$

$$7\sqrt{216} \times 7\sqrt{6} = 7 \times 7 \times \sqrt{216 \times 6}$$

$$= 49 \times \sqrt{1296}$$

Long division: $3 \times 3 = 9$, remainder 3; bring down 96 to get 396; $66 \times 6 = 396$. So $\sqrt{1296} = 36$
 $= 49 \times 36 = 1764$

Ans: (B) 1764

17. $\frac{\sqrt{108}}{3\sqrt{3}} =$

$$\sqrt{108} = \sqrt{36 \times 3} = 6\sqrt{3}$$

$$\frac{6\sqrt{3}}{3\sqrt{3}} = 2$$

Ans: (A) 2

18. $\frac{3 \times \sqrt{361}}{\sqrt{19}} =$

$$\frac{\sqrt{361}}{\sqrt{19}} = \sqrt{\frac{361}{19}} = \sqrt{19}$$

$$\therefore 3 \times \sqrt{19} = 3\sqrt{19}$$

Ans: (D) $3\sqrt{19}$

19. $\sqrt{325} =$

$$\sqrt{325} = \sqrt{25 \times 13} = \sqrt{25} \times \sqrt{13} = 5\sqrt{13}$$

Ans: (A) $5\sqrt{13}$

20. $\sqrt{252} + \sqrt{112} =$

$$\sqrt{252} = \sqrt{36 \times 7} = \sqrt{36} \times \sqrt{7} = 6\sqrt{7}$$

$$\sqrt{112} = \sqrt{16 \times 7} = \sqrt{16} \times \sqrt{7} = 4\sqrt{7}$$

$$6\sqrt{7} + 4\sqrt{7} = 10\sqrt{7}$$

Ans: (A) $10\sqrt{7}$

21. Real numbers are not closed under

Example: $7, 0 \in R$ but $\frac{7}{0}$ is not defined, so $\frac{7}{0} \notin R$.

Sum, difference and product of two real numbers are always real numbers.

Ans: (B) division

22. For $a = -19$ and $b = -7$, which of the following is NOT true?

$$a - b = -19 - (-7) = -12, b - a = -7 - (-19) = 12$$

So $a - b \neq b - a$.

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

23. $11 \times (8 \times (-\frac{11}{5})) = (11 \times 8) \times (-\frac{11}{5})$ shows the

The numbers stay in the same order; only the grouping (brackets) changes.

$$a \times (b \times c) = (a \times b) \times c$$

Ans: (C) associative property under multiplication

24. The additive identity of real numbers is

$a + 0 = 0 + a = a$, so 0 is the additive identity.

Ans: (B) 0

25. The additive inverse of 29 is

Additive inverse of a is $-a$, since $a + (-a) = 0$.

$$29 + (-29) = 0$$

Ans: (B) -29
