

Real Numbers and their Properties

MCQ Test, Set 05

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.

- The $\frac{p}{q}$ form of -12 is
 A. $\frac{-12}{0}$ B. $\frac{12}{1}$ C. $\frac{-12}{1}$ D. $\frac{1}{-12}$
- How many integers are there between 0 and 5?
 A. 5 B. 3 C. 6 D. 4
- Which of these cannot be written in the form $\frac{p}{q}$, where p, q are integers and $q \neq 0$?
 A. $8.\bar{7}$ B. $\sqrt{94}$ C. $-\frac{8}{13}$ D. 4.043
- $2.\bar{4}$ is
 A. a natural number B. an irrational number
 C. a rational number D. an integer
- $-\frac{29}{2}$ belongs to which of these sets?
 A. Q^* (irrational numbers) B. W (whole numbers)
 C. N (natural numbers) D. Q (rational numbers)
- $4.\bar{1}$ belongs to which of these sets?
 A. Z (integers) B. Q (rational numbers)
 C. N (natural numbers) D. W (whole numbers)
- Add $11\sqrt{22}$ and $16\sqrt{22}$.
 A. $-5\sqrt{22}$ B. $27\sqrt{22}$ C. $-27\sqrt{22}$ D. $27\sqrt{44}$
- Add $8 + 5\sqrt{22}$ and $-15 - 3\sqrt{22}$.
 A. $-7 + 2\sqrt{22}$ B. $23 + 2\sqrt{22}$ C. $-5\sqrt{22}$ D. $-7 + 8\sqrt{22}$
- Subtract $-23\sqrt{11}$ from $7\sqrt{11}$.
 A. $16\sqrt{11}$ B. $-16\sqrt{11}$ C. $30\sqrt{11}$ D. $-30\sqrt{11}$
- Subtract $(-9 + 5\sqrt{10})$ from $(4 + 11\sqrt{10})$.
 A. $13 + 6\sqrt{10}$ B. $-13 - 6\sqrt{10}$ C. $13 + 16\sqrt{10}$ D. $-5 + 6\sqrt{10}$

11. $9\sqrt{5} \times 12\sqrt{13} =$
A. $108\sqrt{18}$ **B.** $21\sqrt{65}$ **C.** $-108\sqrt{65}$ **D.** $108\sqrt{65}$
-
12. $\sqrt{6} \times \sqrt{17} =$
A. $\sqrt{102}$ **B.** $6\sqrt{17}$ **C.** 102 **D.** $\sqrt{23}$
-
13. $14\sqrt{6} - 28\sqrt{6} - 29\sqrt{6} =$
A. $-43\sqrt{6}$ **B.** $43\sqrt{6}$ **C.** $-71\sqrt{6}$ **D.** $-42\sqrt{6}$
-
14. $5856\sqrt{14} + 3207\sqrt{14} - 33000\sqrt{14} =$
A. $23937\sqrt{14}$ **B.** $-23947\sqrt{14}$ **C.** $-42063\sqrt{14}$ **D.** $-23937\sqrt{14}$
-
15. $-2\sqrt{54} \times (-5\sqrt{24}) =$
A. -360 **B.** 12960 **C.** 360 **D.** -252
-
16. $-2\sqrt{2} \times 2\sqrt{128} =$
A. -1024 **B.** 12 **C.** -64 **D.** 64
-
17. $\frac{\sqrt{30}}{\sqrt{6}} =$
A. 5 **B.** $\sqrt{5}$ **C.** $\sqrt{24}$ **D.** $\sqrt{180}$
-
18. $\frac{14}{\sqrt{14}} =$
A. $14\sqrt{14}$ **B.** 1 **C.** $\sqrt{14}$ **D.** 14
-
19. $\sqrt{245} =$
A. $49\sqrt{5}$ **B.** $7\sqrt{35}$ **C.** $5\sqrt{7}$ **D.** $7\sqrt{5}$
-
20. $\sqrt{60}$ in the simplest form is
A. $2\sqrt{15}$ **B.** $2\sqrt{30}$ **C.** $4\sqrt{15}$ **D.** $15\sqrt{2}$
-
21. If $a = 7\sqrt{19}$ and $b = -3\sqrt{19}$, then $a \times b$ is
A. 76 **B.** -399 **C.** $-21\sqrt{38}$ **D.** $-21\sqrt{19}$
-
22. If $70 \div 10 = 7$, then $10 \div 70 =$
A. -7 **B.** $-\frac{1}{7}$ **C.** 7 **D.** $\frac{1}{7}$
-
23. $(45 \div 15) \div 5 =$
A. 9 **B.** $\frac{3}{5}$ **C.** 3 **D.** 15
-
24. $4\sqrt{21} \times \underline{\hspace{1cm}} = 4\sqrt{21}$. The number in the blank is
A. 1 **B.** $\frac{1}{4\sqrt{21}}$ **C.** $4\sqrt{21}$ **D.** 0
-
25. The multiplicative inverse of -28 is
A. 28 **B.** $-\frac{1}{28}$ **C.** 1 **D.** $\frac{1}{28}$
-

Key sheet

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

Solutions

1. The $\frac{p}{q}$ form of -12 is

Every integer can be written with $q = 1$ ($q \neq 0$).

$$-12 = \frac{-12}{1}$$

Ans: (C) $\frac{-12}{1}$

2. How many integers are there between 0 and 5?

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

The integers between 0 and 5 are 1, 2, 3, 4, that is 4 numbers.

Ans: (D) 4

3. Which of these cannot be written in the form $\frac{p}{q}$, where p, q are integers and $q \neq 0$?

$\sqrt{94} = 9.6953\dots$ 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) $\sqrt{94}$

4. $2.\overline{4}$ is

$2.\overline{4}$ is a non terminating recurring decimal, so it is rational.

It is not a whole number, so it is not an integer or a natural number.

Ans: (C) a rational number

5. $-\frac{29}{2}$ belongs to which of these sets?

$-\frac{29}{2}$ is in the form $\frac{p}{q}$ with $q \neq 0$, so it is rational.

So $-\frac{29}{2}$ belongs to $\mathbb{Q}$; it does not belong to $\mathbb{W}$, $\mathbb{N}$ or $\mathbb{Q}^*$.

Ans: (D) $\mathbb{Q}$ (rational numbers)

6. $4.\overline{1}$ belongs to which of these sets?

$4.\overline{1}$ is a non terminating recurring decimal, so it is rational.

So $4.\overline{1}$ belongs to $\mathbb{Q}$; it does not belong to $\mathbb{W}$, $\mathbb{N}$ or $\mathbb{Z}$.

Ans: (B) $\mathbb{Q}$ (rational numbers)

7. Add $11\sqrt{22}$ and $16\sqrt{22}$.

$$\begin{aligned} 11\sqrt{22} + 16\sqrt{22} &= (11 + 16)\sqrt{22} \\ &= 27\sqrt{22} \end{aligned}$$

Ans: (B) $27\sqrt{22}$

8. Add $8 + 5\sqrt{22}$ and $-15 - 3\sqrt{22}$.

$$\begin{aligned} 8 + 5\sqrt{22} - 15 - 3\sqrt{22} &= (8 - 15) + (5 - 3)\sqrt{22} \\ &= -7 + 2\sqrt{22} \end{aligned}$$

Only like terms are added: numbers with numbers, $\sqrt{22}$ terms with $\sqrt{22}$ terms.

Ans: (A) $-7 + 2\sqrt{22}$

9. Subtract $-23\sqrt{11}$ from $7\sqrt{11}$.

$$\begin{aligned}7\sqrt{11} - (-23\sqrt{11}) &= 7\sqrt{11} + 23\sqrt{11} \\&= 30\sqrt{11}\end{aligned}$$

Ans: (C) $30\sqrt{11}$

10. Subtract $(-9 + 5\sqrt{10})$ from $(4 + 11\sqrt{10})$.

$$\begin{aligned}(4 + 11\sqrt{10}) - (-9 + 5\sqrt{10}) &= 4 + 11\sqrt{10} + 9 - 5\sqrt{10} \\&= 13 + 6\sqrt{10}\end{aligned}$$

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

Ans: (A) $13 + 6\sqrt{10}$

11. $9\sqrt{5} \times 12\sqrt{13} =$

$$\begin{aligned}9\sqrt{5} \times 12\sqrt{13} &= 9 \times 12 \times \sqrt{5 \times 13} \\&= 108\sqrt{65}\end{aligned}$$

Ans: (D) $108\sqrt{65}$

12. $\sqrt{6} \times \sqrt{17} =$

$$\begin{aligned}\sqrt{a} \times \sqrt{b} &= \sqrt{a \times b} \\ \sqrt{6} \times \sqrt{17} &= \sqrt{102}\end{aligned}$$

Ans: (A) $\sqrt{102}$

13. $14\sqrt{6} - 28\sqrt{6} - 29\sqrt{6} =$

$$\begin{aligned}14\sqrt{6} - 28\sqrt{6} - 29\sqrt{6} &= (14 - 28 - 29)\sqrt{6} \\&= -43\sqrt{6}\end{aligned}$$

Ans: (A) $-43\sqrt{6}$

14. $5856\sqrt{14} + 3207\sqrt{14} - 33000\sqrt{14} =$

$$\text{Positive terms: } 5856\sqrt{14} + 3207\sqrt{14} = 9063\sqrt{14}$$

$$\text{Negative terms: } 33000\sqrt{14}$$

$$\begin{aligned}5856\sqrt{14} + 3207\sqrt{14} - 33000\sqrt{14} &= 9063\sqrt{14} - 33000\sqrt{14} \\&= -(33000 - 9063)\sqrt{14} = -23937\sqrt{14}\end{aligned}$$

Ans: (D) $-23937\sqrt{14}$

15. $-2\sqrt{54} \times (-5\sqrt{24}) =$

$$\begin{aligned}-2\sqrt{54} \times (-5\sqrt{24}) &= -2 \times (-5) \times \sqrt{54 \times 24} \\&= 10 \times \sqrt{1296}\end{aligned}$$

$$\begin{aligned}\text{Long division: } 3 \times 3 &= 9, \text{ remainder } 3; \text{ bring down } 96 \text{ to get } 396; 66 \times 6 = 396. \text{ So } \sqrt{1296} = 36 \\&= 10 \times 36 = 360\end{aligned}$$

Ans: (C) 360

16. $-2\sqrt{2} \times 2\sqrt{128} =$
 $-2\sqrt{2} \times 2\sqrt{128} = -2 \times 2 \times \sqrt{2 \times 128}$
 $= -4 \times \sqrt{256}$
 $\sqrt{256} = 16$
 $= -4 \times 16 = -64$

Ans: (C) -64

17. $\frac{\sqrt{30}}{\sqrt{6}} =$
 $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$
 $\frac{\sqrt{30}}{\sqrt{6}} = \sqrt{5}$

Ans: (B) $\sqrt{5}$

18. $\frac{14}{\sqrt{14}} =$
 $\frac{a}{\sqrt{a}} = \frac{\sqrt{a} \times \sqrt{a}}{\sqrt{a}} = \sqrt{a}$
 $\frac{14}{\sqrt{14}} = \sqrt{14}$

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

19. $\sqrt{245} =$
 $\sqrt{245} = \sqrt{49 \times 5} = \sqrt{49} \times \sqrt{5} = 7\sqrt{5}$
 Ans: (D) $7\sqrt{5}$

20. $\sqrt{60}$ in the simplest form is
 $\sqrt{60} = \sqrt{4 \times 15} = \sqrt{4} \times \sqrt{15} = 2\sqrt{15}$
 Ans: (A) $2\sqrt{15}$

21. If $a = 7\sqrt{19}$ and $b = -3\sqrt{19}$, then $a \times b$ is
 $a \times b = -21 \times 19 = -399 \in R$
 Ans: (B) -399

22. If $70 \div 10 = 7$, then $10 \div 70 =$
 $10 \div 70 = \frac{10}{70} = \frac{1}{7}$
 Division is not commutative.
 Ans: (D) $\frac{1}{7}$

23. $(45 \div 15) \div 5 =$
 $(45 \div 15) \div 5 = 3 \div 5 = \frac{3}{5}$
 Do the bracket first. Division is not associative, so $45 \div (15 \div 5) = 15$ is different.
 Ans: (B) $\frac{3}{5}$

24. $4\sqrt{21} \times \underline{\hspace{1cm}} = 4\sqrt{21}$. The number in the blank is
 $a \times 1 = a$: 1 is the multiplicative identity.
 Ans: (A) 1

25. The multiplicative inverse of -28 is

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

$$-28 \times \left(-\frac{1}{28}\right) = 1$$

Ans: (B) $-\frac{1}{28}$
