

Real Numbers and their Properties

MCQ Test, Set 08

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. The $\frac{p}{q}$ form of -20 is

- A. $\frac{20}{1}$ B. $\frac{-20}{0}$ C. $\frac{-20}{1}$ D. $\frac{1}{-20}$

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

- A. 7 B. 6 C. 8 D. 5

3. Which one of the following is NOT irrational?

- A. e B. $\sqrt{90}$ C. π D. 0.611

4. 1.27 is

- A. an irrational number B. a natural number
C. a rational number D. an integer

5. Pick the true statement.

- A. $1.\bar{8} \in \mathbb{Z}$ B. $4.\bar{5} \in \mathbb{Z}$ C. $\sqrt{14} \in \mathbb{R}$ D. $-\frac{30}{13} \in \mathbb{W}$

6. $0.\bar{6}$ belongs to which of these sets?

- A. $\mathbb{Z}$ (integers) B. $\mathbb{Q}$ (rational numbers)
C. $\mathbb{W}$ (whole numbers) D. $\mathbb{N}$ (natural numbers)

7. Add $22\sqrt{3}$ and $-21\sqrt{3}$.

- A. $-\sqrt{3}$ B. $-43\sqrt{3}$ C. $43\sqrt{3}$ D. $\sqrt{3}$

8. Add $-10\sqrt{11} + 7\sqrt{6}$ and $12\sqrt{11} + 3\sqrt{6}$.

- A. $2\sqrt{6} + 10\sqrt{11}$ B. $2\sqrt{11} + 10\sqrt{6}$
C. $2\sqrt{11} - 10\sqrt{6}$ D. $-22\sqrt{11} + 10\sqrt{6}$

9. Subtract $(-10 - 4\sqrt{7})$ from $(-10 + 4\sqrt{7})$.

- A. $8\sqrt{7}$ B. -20 C. $-8\sqrt{7}$ D. 0

10. Subtract $-13\sqrt{2}$ from $-17\sqrt{2}$.

- A. $30\sqrt{2}$ B. $4\sqrt{2}$ C. $-30\sqrt{2}$ D. $-4\sqrt{2}$

11. $12\sqrt{23} \times (-12\sqrt{23}) =$
A. 3312 **B.** $-144\sqrt{23}$ **C.** 0 **D.** -3312
-
12. $10\sqrt{5} \times 11\sqrt{21} =$
A. $-110\sqrt{105}$ **B.** $21\sqrt{105}$ **C.** $110\sqrt{105}$ **D.** $110\sqrt{26}$
-
13. $-10\sqrt{2} + 25\sqrt{2} - 7\sqrt{2} =$
A. $7\sqrt{2}$ **B.** $42\sqrt{2}$ **C.** $8\sqrt{2}$ **D.** $-8\sqrt{2}$
-
14. $-7008\sqrt{5} + 30130\sqrt{5} - 548680\sqrt{5} =$
A. $-525558\sqrt{5}$ **B.** $525558\sqrt{5}$ **C.** $-585818\sqrt{5}$ **D.** $-525568\sqrt{5}$
-
15. $-4\sqrt{2} \times (-5\sqrt{18}) =$
A. -54 **B.** 120 **C.** 720 **D.** -120
-
16. $-3\sqrt{13} \times (-7\sqrt{117}) =$
A. 31941 **B.** -390 **C.** -819 **D.** 819
-
17. $\frac{\sqrt{180}}{2\sqrt{5}} =$
A. 3 **B.** 6 **C.** 2 **D.** 18
-
18. $\frac{6 \times \sqrt{9}}{\sqrt{3}} =$
A. 18 **B.** $\sqrt{3}$ **C.** $6\sqrt{3}$ **D.** $\sqrt{9}$
-
19. $\sqrt{180} =$
A. $36\sqrt{5}$ **B.** $6\sqrt{30}$ **C.** $5\sqrt{6}$ **D.** $6\sqrt{5}$
-
20. $\sqrt{45}$ in the simplest form is
A. $9\sqrt{5}$ **B.** $3\sqrt{5}$ **C.** $3\sqrt{15}$ **D.** $5\sqrt{3}$
-
21. If $a, b \in R$, which of the following may (or may not) belong to R ?
A. $a \times b$ **B.** $\frac{a}{b}$ **C.** $a - b$ **D.** $a + b$
-
22. $-\sqrt{22} + \sqrt{13} = \sqrt{13} + (-\sqrt{22})$ is an example of
A. the commutative property under addition
B. the associative property under addition
C. the closure under addition
D. the additive identity
-
23. $(-36 \div 18) \div 3 =$
A. $-\frac{2}{3}$ **B.** -6 **C.** -12 **D.** -2
-
24. The multiplicative identity of real numbers is
A. $-a$ **B.** 1 **C.** 0 **D.** $\frac{1}{a}$
-

25. The additive inverse of $-\frac{7}{11}$ is

A. $\frac{7}{11}$

B. $-\frac{11}{7}$

C. $\frac{11}{7}$

D. 0

Key sheet

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

Solutions

1. The $\frac{p}{q}$ form of -20 is

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

$$-20 = \frac{-20}{1}$$

Ans: (C) $\frac{-20}{1}$

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

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

The integers between -6 and 1 are $-5, -4, -3, -2, -1, 0$, that is 6 numbers.

Ans: (B) 6

3. Which one of the following is NOT irrational?

0.611 is a terminating decimal, so it is rational.

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

Ans: (D) 0.611

4. 1.27 is

1.27 is a terminating 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. Pick the true statement.

Both rational and irrational numbers are real numbers, so $\sqrt{14} \in \mathbb{R}$ is true.

The other three statements are false.

Ans: (C) $\sqrt{14} \in \mathbb{R}$

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

$0.\overline{6}$ is a non terminating recurring decimal, so it is rational.

So $0.\overline{6}$ belongs to $\mathbb{Q}$; it does not belong to $\mathbb{N}$, $\mathbb{Z}$ or $\mathbb{W}$.

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

7. Add $22\sqrt{3}$ and $-21\sqrt{3}$.

$$22\sqrt{3} - 21\sqrt{3} = (22 - 21)\sqrt{3}$$

$$= \sqrt{3}$$

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

8. Add $-10\sqrt{11} + 7\sqrt{6}$ and $12\sqrt{11} + 3\sqrt{6}$.

$$-10\sqrt{11} + 7\sqrt{6} + 12\sqrt{11} + 3\sqrt{6} = (-10 + 12)\sqrt{11} + (7 + 3)\sqrt{6}$$

$$= 2\sqrt{11} + 10\sqrt{6}$$

Ans: (B) $2\sqrt{11} + 10\sqrt{6}$

9. Subtract $(-10 - 4\sqrt{7})$ from $(-10 + 4\sqrt{7})$.

$$\begin{aligned}(-10 + 4\sqrt{7}) - (-10 - 4\sqrt{7}) &= -10 + 4\sqrt{7} + 10 + 4\sqrt{7} \\&= 8\sqrt{7}\end{aligned}$$

Ans: (A) $8\sqrt{7}$

10. Subtract $-13\sqrt{2}$ from $-17\sqrt{2}$.

$$\begin{aligned}-17\sqrt{2} - (-13\sqrt{2}) &= -17\sqrt{2} + 13\sqrt{2} \\&= -4\sqrt{2}\end{aligned}$$

Ans: (D) $-4\sqrt{2}$

11. $12\sqrt{23} \times (-12\sqrt{23}) =$

$$\begin{aligned}12\sqrt{23} \times (-12\sqrt{23}) &= 12 \times (-12) \times \sqrt{23} \times \sqrt{23} \\&= -144 \times 23 = -3312 \text{ (since } \sqrt{a} \times \sqrt{a} = a\text{)}\end{aligned}$$

Ans: (D) -3312

12. $10\sqrt{5} \times 11\sqrt{21} =$

$$\begin{aligned}10\sqrt{5} \times 11\sqrt{21} &= 10 \times 11 \times \sqrt{5 \times 21} \\&= 110\sqrt{105}\end{aligned}$$

Ans: (C) $110\sqrt{105}$

13. $-10\sqrt{2} + 25\sqrt{2} - 7\sqrt{2} =$

$$\begin{aligned}-10\sqrt{2} + 25\sqrt{2} - 7\sqrt{2} &= (-10 + 25 - 7)\sqrt{2} \\&= 8\sqrt{2}\end{aligned}$$

Ans: (C) $8\sqrt{2}$

14. $-7008\sqrt{5} + 30130\sqrt{5} - 548680\sqrt{5} =$

Positive terms: $30130\sqrt{5}$

Negative terms: $7008\sqrt{5} + 548680\sqrt{5} = 555688\sqrt{5}$

$$\begin{aligned}-7008\sqrt{5} + 30130\sqrt{5} - 548680\sqrt{5} &= 30130\sqrt{5} - 555688\sqrt{5} \\&= -(555688 - 30130)\sqrt{5} = -525558\sqrt{5}\end{aligned}$$

Ans: (A) $-525558\sqrt{5}$

15. $-4\sqrt{2} \times (-5\sqrt{18}) =$

$$\begin{aligned}-4\sqrt{2} \times (-5\sqrt{18}) &= -4 \times (-5) \times \sqrt{2 \times 18} \\&= 20 \times \sqrt{36} \\&= 20 \times 6 = 120\end{aligned}$$

Ans: (B) 120

16. $-3\sqrt{13} \times (-7\sqrt{117}) =$

$$-3\sqrt{13} \times (-7\sqrt{117}) = -3 \times (-7) \times \sqrt{13 \times 117}$$

$$= 21 \times \sqrt{1521}$$

Long division: $3 \times 3 = 9$, remainder 6; bring down 21 to get 621; $69 \times 9 = 621$. So $\sqrt{1521} = 39$
 $= 21 \times 39 = 819$

Ans: (D) 819

17. $\frac{\sqrt{180}}{2\sqrt{5}} =$

$$\sqrt{180} = \sqrt{36 \times 5} = 6\sqrt{5}$$

$$\frac{6\sqrt{5}}{2\sqrt{5}} = 3$$

Ans: (A) 3

18. $\frac{6 \times \sqrt{9}}{\sqrt{3}} =$

$$\frac{\sqrt{9}}{\sqrt{3}} = \sqrt{\frac{9}{3}} = \sqrt{3}$$

$$\therefore 6 \times \sqrt{3} = 6\sqrt{3}$$

Ans: (C) $6\sqrt{3}$

19. $\sqrt{180} =$

$$\sqrt{180} = \sqrt{36 \times 5} = \sqrt{36} \times \sqrt{5} = 6\sqrt{5}$$

Ans: (D) $6\sqrt{5}$

20. $\sqrt{45}$ in the simplest form is

$$\sqrt{45} = \sqrt{9 \times 5} = \sqrt{9} \times \sqrt{5} = 3\sqrt{5}$$

Ans: (B) $3\sqrt{5}$

21. If $a, b \in R$, which of the following may (or may not) belong to R ?

$a + b, a - b, a \times b$ always belong to R .

$\frac{a}{b}$ may not: for $b = 0, \frac{a}{0} \notin R$.

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

22. $-\sqrt{22} + \sqrt{13} = \sqrt{13} + (-\sqrt{22})$ is an example of

The two numbers change places and the result is the same: $a + b = b + a$.

Ans: (A) the commutative property under addition

23. $(-36 \div 18) \div 3 =$

$$(-36 \div 18) \div 3 = -2 \div 3 = -\frac{2}{3}$$

Do the bracket first. Division is not associative, so $-36 \div (18 \div 3) = -6$ is different.

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

24. The multiplicative identity of real numbers is

$a \times 1 = 1 \times a = a$, so 1 is the multiplicative identity.

Ans: (B) 1

25. The additive inverse of $-\frac{7}{11}$ is

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

$$-\frac{7}{11} + \frac{7}{11} = 0$$

Ans: (A) $\frac{7}{11}$
