

Real Numbers and their Properties

MCQ Test, Set 07

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 -11 and -4 ?

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

2. The integers between 1 and 7 are

- A.** 2, 3, 4, 5, 6 **B.** 1, 2, 3, 4, 5, 6, 7 **C.** 3, 4, 5, 6 **D.** 2, 3, 4, 5, 6, 7

3. Which of the following belongs to Q^* , the set of irrational numbers?

- A.** $\sqrt{61}$ **B.** 1.938 **C.** $2.\bar{2}$ **D.** $-\frac{19}{7}$

4. $5.\bar{1}$ is

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

5. -10 belongs to which of these sets?

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

6. π belongs to which of these sets?

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

7. Add $-15\sqrt{21}$ and $6\sqrt{21}$.

- A.** $-9\sqrt{21}$ **B.** $-9\sqrt{42}$ **C.** $-21\sqrt{21}$ **D.** $9\sqrt{21}$

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

- A.** $9 + 10\sqrt{3}$ **B.** $-3 + 12\sqrt{3}$ **C.** $7\sqrt{3}$ **D.** $-3 + 10\sqrt{3}$

9. Subtract $-9\sqrt{22}$ from $-7\sqrt{22}$.

- A.** $-2\sqrt{22}$ **B.** $16\sqrt{22}$ **C.** $2\sqrt{22}$ **D.** $-16\sqrt{22}$

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

- A.** $-1 - 9\sqrt{10}$ **B.** $19 + 9\sqrt{10}$ **C.** $-19 - 9\sqrt{10}$ **D.** $-19 - \sqrt{10}$

11. $2\sqrt{7} \times 9\sqrt{19} =$
A. $11\sqrt{133}$ **B.** $18\sqrt{26}$ **C.** $-18\sqrt{133}$ **D.** $18\sqrt{133}$
-
12. $\sqrt{5} \times \sqrt{21} =$
A. $5\sqrt{21}$ **B.** $\sqrt{26}$ **C.** $\sqrt{105}$ **D.** 105
-
13. $-20\sqrt{22} - 11\sqrt{22} + 25\sqrt{22} =$
A. $-5\sqrt{22}$ **B.** $-56\sqrt{22}$ **C.** $6\sqrt{22}$ **D.** $-6\sqrt{22}$
-
14. $-10048\sqrt{15} + 90570\sqrt{15} - 25275\sqrt{15} + 49930\sqrt{15} =$
A. $175823\sqrt{15}$ **B.** $105177\sqrt{15}$ **C.** $105187\sqrt{15}$ **D.** $-105177\sqrt{15}$
-
15. $3\sqrt{32} \times (-3\sqrt{8}) =$
A. -144 **B.** 7 **C.** -2304 **D.** 144
-
16. $-6\sqrt{72} \times (-4\sqrt{2}) =$
A. -120 **B.** 288 **C.** 3456 **D.** -288
-
17. $\frac{\sqrt{42}}{\sqrt{7}} =$
A. 6 **B.** $\sqrt{35}$ **C.** $\sqrt{6}$ **D.** $\sqrt{294}$
-
18. $\frac{8}{\sqrt{8}} =$
A. $8\sqrt{8}$ **B.** $\sqrt{8}$ **C.** 8 **D.** 1
-
19. $\sqrt{252}$ in the simplest form is
A. $6\sqrt{42}$ **B.** $6\sqrt{7}$ **C.** $7\sqrt{6}$ **D.** $36\sqrt{7}$
-
20. $\sqrt{245} - \sqrt{320} =$
A. $\sqrt{5}$ **B.** $-\sqrt{10}$ **C.** $-15\sqrt{5}$ **D.** $-\sqrt{5}$
-
21. If $a = 11\sqrt{13}$ and $b = -7\sqrt{13}$, then $a + b$ is
A. 4 **B.** $4\sqrt{13}$ **C.** $4\sqrt{26}$ **D.** $18\sqrt{13}$
-
22. If $41 - 8 = 33$, then $8 - 41 =$
A. -33 **B.** 33 **C.** -49 **D.** 49
-
23. $13 - (39 - 15) =$
A. 67 **B.** -41 **C.** 37 **D.** -11
-
24. $-\frac{23}{10} \times \underline{\hspace{1cm}} = -\frac{23}{10}$. The number in the blank is
A. $-\frac{10}{23}$ **B.** $-\frac{23}{10}$ **C.** 1 **D.** 0
-
25. The multiplicative inverse of $6\sqrt{11}$ is
A. $\frac{1}{6\sqrt{11}}$ **B.** $-\frac{1}{6\sqrt{11}}$ **C.** 1 **D.** $-6\sqrt{11}$
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Key sheet

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

Solutions

1. How many integers are there between -11 and -4 ?

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

The integers between -11 and -4 are $-10, -9, -8, -7, -6, -5$, that is 6 numbers.

Ans: (D) 6

2. The integers between 1 and 7 are

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

So the integers between 1 and 7 are 2, 3, 4, 5, 6.

Ans: (A) 2, 3, 4, 5, 6

3. Which of the following belongs to $\mathbb{Q}^*$, the set of irrational numbers?

$\sqrt{61} = 7.8102\dots$ 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: (A) $\sqrt{61}$

4. $5.\overline{1}$ is

$5.\overline{1}$ 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: (B) a rational number

5. -10 belongs to which of these sets?

So -10 belongs to $\mathbb{Q}$; it does not belong to $\mathbb{W}$, $\mathbb{Q}^*$ or $\mathbb{N}$.

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

6. π belongs to which of these sets?

$\pi = 3.14159\dots$ is a non terminating non recurring decimal, so it is irrational.

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

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

7. Add $-15\sqrt{21}$ and $6\sqrt{21}$.

$$\begin{aligned} -15\sqrt{21} + 6\sqrt{21} &= (-15 + 6)\sqrt{21} \\ &= -9\sqrt{21} \end{aligned}$$

Ans: (A) $-9\sqrt{21}$

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

$$\begin{aligned} 3 + 11\sqrt{3} - 6 - \sqrt{3} &= (3 - 6) + (11 - 1)\sqrt{3} \\ &= -3 + 10\sqrt{3} \end{aligned}$$

Only like terms are added: numbers with numbers, $\sqrt{3}$ terms with $\sqrt{3}$ terms.

Ans: (D) $-3 + 10\sqrt{3}$

9. Subtract $-9\sqrt{22}$ from $-7\sqrt{22}$.

$$\begin{aligned} -7\sqrt{22} - (-9\sqrt{22}) &= -7\sqrt{22} + 9\sqrt{22} \\ &= 2\sqrt{22} \end{aligned}$$

Ans: (C) $2\sqrt{22}$

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

$$\begin{aligned} (-10 - 5\sqrt{10}) - (9 + 4\sqrt{10}) &= -10 - 5\sqrt{10} - 9 - 4\sqrt{10} \\ &= -19 - 9\sqrt{10} \end{aligned}$$

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

Ans: (C) $-19 - 9\sqrt{10}$

11. $2\sqrt{7} \times 9\sqrt{19} =$

$$\begin{aligned} 2\sqrt{7} \times 9\sqrt{19} &= 2 \times 9 \times \sqrt{7 \times 19} \\ &= 18\sqrt{133} \end{aligned}$$

Ans: (D) $18\sqrt{133}$

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

$$\begin{aligned} \sqrt{a} \times \sqrt{b} &= \sqrt{a \times b} \\ \sqrt{5} \times \sqrt{21} &= \sqrt{105} \end{aligned}$$

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

13. $-20\sqrt{22} - 11\sqrt{22} + 25\sqrt{22} =$

$$\begin{aligned} -20\sqrt{22} - 11\sqrt{22} + 25\sqrt{22} &= (-20 - 11 + 25)\sqrt{22} \\ &= -6\sqrt{22} \end{aligned}$$

Ans: (D) $-6\sqrt{22}$

14. $-10048\sqrt{15} + 90570\sqrt{15} - 25275\sqrt{15} + 49930\sqrt{15} =$

$$\text{Positive terms: } 90570\sqrt{15} + 49930\sqrt{15} = 140500\sqrt{15}$$

$$\text{Negative terms: } 10048\sqrt{15} + 25275\sqrt{15} = 35323\sqrt{15}$$

$$\begin{aligned} -10048\sqrt{15} + 90570\sqrt{15} - 25275\sqrt{15} + 49930\sqrt{15} &= 140500\sqrt{15} - 35323\sqrt{15} \\ &= (140500 - 35323)\sqrt{15} = 105177\sqrt{15} \end{aligned}$$

Ans: (B) $105177\sqrt{15}$

15. $3\sqrt{32} \times (-3\sqrt{8}) =$

$$\begin{aligned} 3\sqrt{32} \times (-3\sqrt{8}) &= 3 \times (-3) \times \sqrt{32 \times 8} \\ &= -9 \times \sqrt{256} \end{aligned}$$

$$\sqrt{256} = 16$$

$$= -9 \times 16 = -144$$

Ans: (A) -144

16. $-6\sqrt{72} \times (-4\sqrt{2}) =$
 $-6\sqrt{72} \times (-4\sqrt{2}) = -6 \times (-4) \times \sqrt{72 \times 2}$
 $= 24 \times \sqrt{144}$
 $\sqrt{144} = 12$
 $= 24 \times 12 = 288$

Ans: (B) 288

17. $\frac{\sqrt{42}}{\sqrt{7}} =$
 $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$
 $\frac{\sqrt{42}}{\sqrt{7}} = \sqrt{6}$

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

18. $\frac{8}{\sqrt{8}} =$
 $\frac{a}{\sqrt{a}} = \frac{\sqrt{a} \times \sqrt{a}}{\sqrt{a}} = \sqrt{a}$
 $\frac{8}{\sqrt{8}} = \sqrt{8}$

Ans: (B) $\sqrt{8}$

19. $\sqrt{252}$ in the simplest form is
 $\sqrt{252} = \sqrt{36 \times 7} = \sqrt{36} \times \sqrt{7} = 6\sqrt{7}$

Ans: (B) $6\sqrt{7}$

20. $\sqrt{245} - \sqrt{320} =$
 $\sqrt{245} = \sqrt{49 \times 5} = \sqrt{49} \times \sqrt{5} = 7\sqrt{5}$
 $\sqrt{320} = \sqrt{64 \times 5} = \sqrt{64} \times \sqrt{5} = 8\sqrt{5}$
 $7\sqrt{5} - 8\sqrt{5} = -\sqrt{5}$

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

21. If $a = 11\sqrt{13}$ and $b = -7\sqrt{13}$, then $a + b$ is
 $a + b = 4\sqrt{13} \in R$

Ans: (B) $4\sqrt{13}$

22. If $41 - 8 = 33$, then $8 - 41 =$
 $8 - 41 = -(41 - 8) = -33$
 Subtraction is not commutative: $33 \neq -33$.

Ans: (A) -33

23. $13 - (39 - 15) =$
 $13 - (39 - 15) = 13 - 24 = -11$
 Note $(13 - 39) - 15 = -41$: subtraction is not associative.

Ans: (D) -11

24. $-\frac{23}{10} \times \underline{\hspace{1cm}} = -\frac{23}{10}$. The number in the blank is $a \times 1 = a$: 1 is the multiplicative identity.

Ans: (C) 1

25. The multiplicative inverse of $6\sqrt{11}$ is
Multiplicative inverse of a is $\frac{1}{a}$, since $a \times \frac{1}{a} = 1$.

$$6\sqrt{11} \times \frac{1}{6\sqrt{11}} = 1$$

Ans: (A) $\frac{1}{6\sqrt{11}}$
