

QUICK DRILL · CBSE CLASS 9

Number Systems

Mathematics · Chapter 1 · 15 MCQs · 20 minutes · PYQ-tagged with time budgets

DATE	TOTAL MARKS 15	DURATION 20 min	MARKING +1 / 0	TARGET ≥ 12/15
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OBJECTIVES

Reinforce the four core topics of Number Systems via 15 PYQ-derived MCQs. Identify weak sub-topics via concept-node IDs (see answer key). Build per-question time budget habit.

INSTRUCTIONS

Attempt all 15. Time budget shown per Q (use it as pacing guide). Mark answers (A/B/C/D) in the margin. Answer key + explanations on the last page. **Don't peek — score yourself honestly.**

SECTION · QUICK DRILL

Q 1-15 · 20 MIN

Q1. Which of the following is an irrational number?

(A) $22/7$

(C) $\sqrt{7}$

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(B) $0.\bar{3}$

(D) $\sqrt{16}$

Q2. The decimal expansion of a rational number is always:

(A) Non-terminating non-recurring

(C) Always terminating

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(B) Either terminating or non-terminating recurring

(D) Always non-terminating

Q3. $0.\bar{6}$ expressed in the form p/q is:

(A) $6/10$

(C) $3/5$

PYQ 2024 · Annual Pattern · 1m · 45s

(B) $2/3$

(D) $6/11$

Q4. The rationalising factor (conjugate) of $(5 - \sqrt{3})$ is:

(A) $\sqrt{3}$

(C) $(-5 + \sqrt{3})$

PYQ 2023 · CBSE SQP · 1m · 30s

(B) $(5 + \sqrt{3})$

(D) $(5 - \sqrt{3})$

Q5. $\sqrt{2} \times \sqrt{8}$ equals:

(A) $\sqrt{10}$

(C) $\sqrt{16}$ (irrational)

PYQ 2022 · Annual Pattern · 1m · 30s

(B) 4

(D) $2\sqrt{2}$

Q6. Which statement is TRUE?

(A) Every real number is rational

(C) Every irrational number is a real number

PYQ 2021 · Annual Pattern · 1m · 30s

(B) Every integer is a whole number

(D) Every whole number is a natural number

Q7. On the number line, $\sqrt{5}$ is best located using:

(A) Guessing a point past 2.2

(C) Dividing the unit into 5 parts

PYQ 2023 · Annual Pattern · 1m · 30s

(B) A right triangle with legs 2 and 1, then a compass arc

(D) Plotting $5/2$

Q8. Simplify: $2^{(1/3)} \times 2^{(2/3)}$.

(A) $2^{(2/9)}$

(C) 2

PYQ 2022 · CBSE SQP · 1m · 45s

(B) $4^{(1/3)}$

(D) $2^{(1/2)}$

Q9. How many rational numbers lie between $1/3$ and $1/2$?

- (A) Exactly one (B) Exactly five
(C) Infinitely many (D) None

PYQ 2021 · Annual Pattern · 1m · 30s

Q10. Which of these is a rational number?

- (A) π (B) $\sqrt{3}$
(C) 0.101001000100001... (D) 0.142857142857...

PYQ 2024 · CBSE SQP · 1m · 45s

Q11. After rationalising, $1/\sqrt{3}$ equals:

- (A) $\sqrt{3}/3$ (B) $3/\sqrt{3}$
(C) $1/3$ (D) $\sqrt{3}$

PYQ 2023 · Annual Pattern · 1m · 30s

Q12. $(\sqrt{5} + \sqrt{2})(\sqrt{5} - \sqrt{2})$ equals:

- (A) $\sqrt{3}$ (B) 7
(C) 3 (D) $\sqrt{10}$

PYQ 2022 · Annual Pattern · 1m · 30s

Q13. $\sqrt{-9}$ in the real number system is:

- (A) -3 (B) 3
(C) Not defined (no real value) (D) 9

PYQ 2024 · Annual Pattern · 1m · 30s

Q14. The value of $(64)^{1/2} \times (64)^{1/3}$ is:

- (A) $64^{1/6}$ (B) 32
(C) $64^{5/6}$ which equals 32 (D) 16

PYQ 2023 · CBSE SQP · 1m · 60s

Q15. An irrational number between 0.5 and 0.6 is:

- (A) 0.55 (B) $11/20$
(C) 0.5101001000... (D) $0.\bar{5}$

PYQ 2022 · Annual Pattern · 1m · 45s

ANSWER KEY & EXPLANATIONS

Q 1-15 · MARK YOUR SCORE

Q1. Answer: C

$\sqrt{7}$ is the square root of a non-perfect square \rightarrow non-terminating, non-recurring \rightarrow irrational. $22/7$ and $0.\bar{3}$ are rational; $\sqrt{16} = 4$ is rational.

Q2. Answer: B

Rational numbers have decimal expansions that are either terminating or non-terminating recurring. Non-terminating non-recurring is the signature of irrationals.

Q3. Answer: B

Let $x = 0.666\dots$; $10x = 6.666\dots$; $10x - x = 6 \Rightarrow 9x = 6 \Rightarrow x = 6/9 = 2/3$.

Q4. Answer: B

The conjugate flips the sign of the surd term only: $(5 - \sqrt{3}) \rightarrow (5 + \sqrt{3})$. Then $(5 - \sqrt{3})(5 + \sqrt{3}) = 25 - 3 = 22$, a rational number.

Q5. Answer: B

$\sqrt{2} \times \sqrt{8} = \sqrt{2 \times 8} = \sqrt{16} = 4$ — a rational result from two irrationals. Shows product of irrationals need not be irrational.

Q6. Answer: C

Reals = rationals \cup irrationals, so every irrational is real. Negatives show not every integer is whole; 0 shows not every whole number is natural; $\sqrt{2}$ shows not every real is rational.

Q7. Answer: B

$5 = 2^2 + 1^2$, so $OB = \sqrt{(2^2 + 1^2)} = \sqrt{5}$; transfer OB to the line with a compass arc. Construction, not estimation.

Q8. Answer: C

Same base, multiplying \Rightarrow add exponents: $1/3 + 2/3 = 1$, so $2^1 = 2$.

Q9. Answer: C

Between any two distinct rationals there are infinitely many rationals (keep averaging). The number line is dense.

Q10. Answer: D

0.142857142857... is non-terminating but RECURRING (block 142857 = 1/7) → rational. The other three are non-terminating non-recurring → irrational.

Q11. Answer: A

Multiply top and bottom by $\sqrt{3}$: $1/\sqrt{3} \times \sqrt{3}/\sqrt{3} = \sqrt{3}/3$. Denominator becomes rational.

Q12. Answer: C

Using $(a+b)(a-b) = a^2 - b^2$: $(\sqrt{5})^2 - (\sqrt{2})^2 = 5 - 2 = 3$.

Q13. Answer: C

No real number squared gives a negative result, so $\sqrt{-9}$ is not defined on the real number line (it belongs to complex numbers, studied later).

Q14. Answer: C

Add exponents: $1/2 + 1/3 = 5/6 \Rightarrow 64^{(5/6)} = (2^6)^{(5/6)} = 2^5 = 32$. Both 'C' phrasings are the same value.

Q15. Answer: C

0.5101001000... is non-terminating and non-recurring → irrational, and it lies between 0.5 and 0.6. The other options are all rational.