



MATHS

NCERT - NCERT MATHEMATICS(TAMIL ENGLISH)

REAL NUMBERS



1. Represent
$$\frac{5}{3}$$
 and $-\frac{5}{3}$ on the number line.

2. Are the following statements True? Give reasons for your answers with an example.

Every rational number is an integer.

Watch Video Solution

3. Are the following statements True? Give reasons for your answers with an example.

Every integer is a rational number

4. Are the following statements True? Give reasons for your answers with an example.

Zero is a rational number

Watch Video Solution

5. Find two rational numbers between 3 and 4

by mean method.

6. Express
$$\frac{7}{16}$$
, $\frac{10}{7}$ and $\frac{2}{3}$ in decimal from.
Watch Video Solution
7. Express 3.28 in the form of $\frac{p}{q}$ (where p and q are intgers, $q \neq 0$).
Watch Video Solution

8. Express 1. $\overline{62}$ in $\frac{p}{q}$ from where $q \neq 0, p, q$

are integers.



9. Locate $\sqrt{2}$ on number line
O Watch Video Solution
10. Locate $\sqrt{3}$ on number line
Watch Video Solution

11. Find any two irrational numbers between $\frac{1}{5}$ and $\frac{2}{7}$.



14. Examine, whether the following numbers are rational or irrational : $(3+\sqrt{3})+(3-\sqrt{3})$

Watch Video Solution

15. Examine, whether the following numbers

are rational or irrational :

 $\frac{10}{10\sqrt{5}}$

16. Examine, whether the following numbers

are rational or irrational :

$$\left(\sqrt{2}+2
ight)^5$$

Watch Video Solution

17. Visualise the representation of $3.5\overline{8}$ on the number line through successive magnification upto 4 decimal places.



21. Simplify the following expressions :

$$\left(3+\sqrt{3}
ight)\left(2+\sqrt{2}
ight)$$



22. Simplify the following expressions :

$$\left(2+\sqrt{3}
ight)\left(2-\sqrt{3}
ight)$$

23. Simplify the following expressions :

$$\left(\sqrt{5}+\sqrt{2}
ight)^2$$

Watch Video Solution

24. Simplify the following expressions :

$$\left(\sqrt{5}-\sqrt{2}
ight)\left(\sqrt{5}+\sqrt{2}
ight)$$

25. Find the square root of
$$5+2\sqrt{6}$$





Watch Video Solution



 $2^{rac{2}{3}}.2^{rac{1}{3}}$

Watch Video Solution

30. Simplify

$$\left(5^{\frac{1}{7}}\right)^4$$



 $7^{rac{1}{17}}.11^{rac{1}{17}}$



34. Represent the following as decimal form $\frac{-4}{11}$



35. Represent the following as decimal form

 $\frac{11}{75}$

View Text Solution

36. Express the rational number $\frac{1}{27}$ in recurring decimal form by using the recurring decimal expansion of $\frac{1}{3}$. Hence write $\frac{59}{27}$ in recurring decimal form.

37. Convert the following decimal numbers in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$:

0.35



38. Convert the following decimal numbers in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$:

2.176

39. Convert the following decimal numbers in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$:

View Text Solution

-0.0028







41. Convert the following decimal numbers in the form of $\frac{p}{q}(p, q \in Z \text{ and } q \neq 0)$. 2. $\overline{124}$



42. Convert the following decimal numbers in the form of $\frac{p}{q}(p, q \in Z \text{ and } q \neq 0)$. 0. $\overline{45}$



43. Convert the following decimal numbers in the form of $\frac{p}{q}(p, q \in Z \text{ and } q \neq 0)$. 0.5 $\overline{68}$

View Text Solution

44. Without actual division, classify the decimal expansion of the following numbers as terminating or non – terminating and

recurring.



45. Without actual division, classify the decimal expansion of the following numbers as terminating or non – terminating and recurring.

$$\frac{-71}{125}$$

46. Without actual division, classify the decimal expansion of the following numbers as terminating or non – terminating and recurring.

375

View Text Solution

47. Without actual division, classify the decimal expansion of the following numbers as terminating or non – terminating and



 $\sqrt{10}$



51. Classify the numbers as rational or irrational:







52. Classify the numbers as rational or irrational:

 $(0.7\overline{6})$

View Text Solution

53. Classify the numbers as rational or irrational:

2.505500555...





and 0.13 .

56. Give any two rational numbers lying between 0.5151151115.... and 0.535335335...
View Text Solution

57. Find whether x and y are rational or irrational in the following.

$$a=2+\sqrt{3},b=2-\sqrt{3},x=a+b,y=a-b$$



58. Find whether x and y are rational or irrational in the following.

$$a=\sqrt{2}+7,b=\sqrt{2}-7,x=a+b,y=a-b$$

View Text Solution

59. Find whether x and y are rational or irrational in the following.

$$a=\sqrt{75}, b=\sqrt{3}, x=ab, y=rac{a}{b}$$

60. Find whether x and y are rational or

irrational in the following.

$$a=\sqrt{18},b=\sqrt{3},x=ab,y=rac{a}{b}$$

View Text Solution

61. Represent 3. $\overline{45}$ on the number line upto 4

decimal places







66. Express the following in the form 2^n :



View Text Solution

67. Find the value of

 $81^{\frac{5}{4}}$





69. Can you reduce the following numbers to surds of same order :



70. Can you reduce the following numbers to

surds of same order :





71. Can you reduce the following numbers to surds of same order :

 $\sqrt[3]{3}$

72. Express the surds in the simplest form:



73. Express the surds in the simplest form:

 $\sqrt[3]{192}$

 $\sqrt{8}$

74. Show that $\sqrt[3]{7} > \sqrt[4]{5}$





76. Express each of the following surds in its simplest form (i) $\sqrt[3]{108}$ (ii) $\sqrt[3]{(1024)^{-2}}$ and

find its order, radicand and coefficient.
77. Add $3\sqrt{7}$ and $5\sqrt{7}$. Check whether the sum

is rational or irrational.



79. Simplify the following:

 $2\sqrt[3]{40} + 3\sqrt[3]{625} - 4\sqrt[3]{320}$





84. Rationalise the denominator of

$$\frac{5+\sqrt{3}}{5-\sqrt{3}}$$



86. Express in scientific notation

0.04567891

87. Express in scientific notation

72006865.48



88. Write the following numbers in decimal

form:

 $6.34 imes 10^4$

89. Write the following numbers in decimal

form:

 $2.00367 imes 10^{-5}$



90. The mass of the Earth is $5.97 imes10^{24}$ kg and that of the Moon is $0.073 imes10^{24}$ kg. What

is their total mass?

91. Write the following in scientific notation :

 $(5000000)^4$



92. Write the following in scientific notation :

 $(0.0000005)^3$

93. Write the following in scientific notation :

 $(300000)^3 imes (2000)^4$

View Text Solution

94. Write the following in scientific notation : $(4000000)^3 \div (0.00002)^4$







3. Find any five rational numbers between 2

and 3 using mean method.

4. Find any 10 rational numbers between

$$-\frac{3}{11}$$
 and $\frac{8}{11}$.

5. Express (i)
$$\frac{1}{17}$$
 (ii) $\frac{1}{19}$ in decimal form.





9. Simplify :

 $(16)^{\frac{1}{2}}$



11. Simplify :

 $(343)^{\frac{1}{5}}$

12. Write the following surds in exponential

form

 $\sqrt{2}$



13. Write the following surds in exponential

form

 $\sqrt[3]{9}$

14. Write the following surds in exponential

form

 $\sqrt[5]{20}$



15. Write the following surds in exponential

form

 $\sqrt[17]{19}$



18. Write the surds in radical form:

 $5^{\frac{1}{7}}$





4. Find the decimal values of the following:

 $rac{1}{5 imes 2}$



5. Find the decimal values of the following:

 $\frac{3}{10}$

Watch Video Solution

6. Find the decimal values of the following:

 $\frac{27}{25}$



9. Find the decimal values of the following:

 $\frac{5}{12}$



10. Find the decimal values of the following:

 $\frac{1}{7}$

Watch Video Solution

11. Find the value of $\sqrt{3}$ upto six decimals.





Think Discuss And Write

- **1.** Kurthi said $\sqrt{2}$ can be written $\frac{\sqrt{2}}{1}$ which is
- in $rac{p}{q}$ form. So $\sqrt{2}$ is a rational number. Do you

agree with her argument?

Watch Video Solution

Exercise 11

1. (a) Write any three rational numbers



2. (b) Explain rational number in your own words.

3. Give one example each to the following

Watch Video Solution

statements.

i. A number which is rational but not an

integer



4. Give one example each to the following statements.

ii. A whole number which is not a natural number

5. Give one example each to the following statements.

iii. An integer which is not a whole number



6. Give one example each to the following statements.

iv. A number which is natural number, whole

number, integer and rational number.



7. Give one example each to the following statements.

v. A number which is an integer but not a natural number.

Watch Video Solution

8. Find five rational numbers between 1 and 2.



11. Express the following rational numbers in

decimal form.

 $\frac{242}{1000}$



 $\frac{354}{500}$



13. Express the following rational numbers in

decimal form.

 $\frac{2}{5}$





14. Express the following rational numbers in

decimal form.

 $\frac{115}{4}$

Watch Video Solution

15. Express the following rational numbers in

decimal form.

 $\frac{2}{3}$



16. Express the following rational numbers in

decimal form.

25

 $\overline{36}$

Watch Video Solution

17. Express the following rational numbers in

decimal form.

 $\frac{22}{7}$

18. Express the following rational numbers in decimal form. $\frac{11}{9}$ Watch Video Solution

- 19. Express each of the following decimals in
- $rac{p}{q}$ form where q
 eq 0 and p, q are integers

0.36



20. Express each of the following decimals in

 $rac{p}{q}$ form where q
eq 0 and p, q are integers

15.4



21. Express each of the following decimals in

 $rac{p}{q}$ form where q
eq 0 and p, q are integers

10.25

22. Express each of the following decimals in $rac{p}{q}$ form where q
eq 0 and p, q are integers

3.25



23. Express each of the following decimal numbers in $\frac{p}{q}$ form 0. $\overline{5}$







25. Express each of the following decimal numbers in $\frac{p}{q}$ form $0.\overline{36}$

0.30



27. Without actually dividing find which of the

following are terminating decimals.

 $\frac{3}{25}$

28. Without actually dividing find which of the

following are terminating decimals.

11 18



29. Without actually dividing find which of the

following are terminating decimals.

 $\frac{13}{20}$


30. Without actually dividing find which of the

following are terminating decimals.

 $\frac{41}{42}$



Exercise 12

1. Classify the following numbers as rational or

irrational.





2. Classify the following numbers as rational or irrational.

 $\sqrt{441}$

Watch Video Solution

3. Classify the following numbers as rational or

irrational.

30.2323342345...



4. Classify the following numbers as rational or irrational.

7.484848...

Watch Video Solution

5. Classify the following numbers as rational or

irrational.

11.21132435465



6. Classify the following numbers as rational or irrational.

0.3030030003...

Watch Video Solution

7. Give four examples for rational and

irrational numbers?



9. Find two irrational numbers between 0.7 and 0.77

Watch Video Solution

10. Find the value of $\sqrt{5}$ upto 3 decimal places.

11. Find the value of $\sqrt{7}$ up to six decimal places by long division method.

Watch Video Solution

12. Locate $\sqrt{10}$ on the number line.

13. Find atleast two irrational numbers
between 2 and 3.
Watch Video Solution

14. State whether the following statements are

true or false. Justify your answers.

(i) Every irrational number is a real number.



15. State whether the following statements are

true or false. Justify your answers.

(ii) Every rational number is a real number.



16. State whether the following statements are

true or false. Justify your answers.

(iii) Every real number need not be a rational

number



17. State whether the following statements are

true or false. Justify your answers.

(iv) n is not irrational if n is a perfect square.



18. State whether the following statements are

true or false. Justify your answers.

(v) \sqrt{n} is irrational if n is not a perfect square.

19. State whether the following statements are

true or false. Justify your answers.

(vi) All real numbers are irrational.



Exercise 13

1. Visualize 4. $\overline{26}$ on the number line upto 4

decimal places.





1. Simplify the following expressions.

 $\left(5+\sqrt{7}
ight)\left(2+\sqrt{5}
ight)$

Watch Video Solution

2. Simplify the following expressions.

$$\left(5+\sqrt{5}
ight)\left(5-\sqrt{3}
ight)$$

3. Simplify the following expressions.

 $\left(\sqrt{3}+\sqrt{7}\right)^2$

Watch Video Solution

4. Simplify the following expressions.

$\left(\sqrt{11}+\sqrt{7} ight)\left(\sqrt{11}+\sqrt{7} ight)$

5. Classify the following numbers as rational or

irrational.

$$5-\sqrt{3}$$



6. Classify the following numbers as rational or

irrational.

$$\sqrt{3} + \sqrt{2}$$

7. Classify the following numbers as rational or

irrational.

$$\left(\sqrt{2}-2
ight)^2$$

Watch Video Solution

8. Classify the following numbers as rational or

irrational.

$$\frac{2\sqrt{7}}{7\sqrt{7}}$$

9. Classify the following numbers as rational or

irrational.

 2π



10. Classify the following numbers as rational

or irrational.



11. Classify the following numbers as rational

or irrational.

$$\left(2+\sqrt{2}
ight)\left(2-\sqrt{2}
ight)$$

Watch Video Solution

12. In the following equations, find whether variables x, y, z etc. represent rational or irrational numbers

$$x^{2} = 7$$

13. In the following equations, find whether variables x, y, z etc. represent rational or irrational numbers

$$y^2 = 16$$

Watch Video Solution

14. In the following equations, find whether variables x, y, z etc. represent rational or irrational numbers

 $z^2=0.02$



15. In the following equations, find whether variables x, y, z etc. represent rational or irrational numbers $u^2 = \frac{17}{4}$

Watch Video Solution

16. In the following equations, find whether variables x, y, z etc. represent rational or

irrational numbers

$$w^{2} = 27$$



17. In the following equations, find whether variables x, y, z etc. represent rational or irrational numbers

 $t^4 = 256$

18. Every surd is an irrational, but every irrational need not be a surd. Justify your answer.



19. Rationalise the denominators of the following:

$$rac{1}{3+\sqrt{2}}$$



21. Rationalise the denominators of the

following:





22. Rationalise the denominators of the

following:

$$rac{\sqrt{6}}{\sqrt{3}-\sqrt{2}}$$



23. Simplify each of the following by

rationalising the denominator:

$$\frac{6-4\sqrt{2}}{6+4\sqrt{2}}$$

24. Simplify each of the following by

rationalising the denominator:

$$\frac{\sqrt{7}-\sqrt{5}}{\sqrt{7}+\sqrt{5}}$$

Watch Video Solution

25. Simplify each of the following by rationalising the denominator: $\frac{1}{3\sqrt{2}-2\sqrt{3}}$ Watch Video Solution

26. Simplify each of the following by

rationalising the denominator:

$$\frac{3\sqrt{5}-\sqrt{7}}{3\sqrt{3}+\sqrt{2}}$$

Watch Video Solution

27. Find the value of
$$rac{\sqrt{10}-\sqrt{5}}{2\sqrt{2}}$$
 upto three decimal places. (take $\sqrt{2}=1.414$ and $\sqrt{5}=2.236$)

28. Find:

 $64^{rac{1}{6}}$

Watch Video Solution

29. Find:

 $32^{rac{1}{5}}$

Watch Video Solution

30. Find:

 $625^{\frac{1}{4}}$





35. If 'a' and 'b' are rational numbers, find the value of a and b in each of the following

equations.

$$rac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}=a+b\sqrt{6}$$

Watch Video Solution

36. If 'a' and 'b' are rational numbers, find the value of a and b in each of the following equations.

$$rac{\sqrt{5}+\sqrt{3}}{2\sqrt{5}-3\sqrt{3}} = a - b\sqrt{15}$$

37. Find the square root of $11 + 2\sqrt{30}$

