

India's Number 1 Education App

MATHS

BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

NUMBER SYSTEMS

Sums To Enrich Remember

1. Are the following statement true or false? Give reasons for your answers :

(i) Every whole number is a natural number.

(ii) Every integer is a rational number.

(iii) Every rational number is an integer.











6. Show that 3.142678 is a rational number In other words express 3.142678 in the form $\frac{p}{q}$

where p and q are integer and q
eq 0



7. Show that $0.3333 = 0.3\overline{3}$ can be expressed in the form $\frac{p}{q}$ where p and q are integer and q
eq 0

8. Show that $1.272727... = 1.\overline{2.7}$ can be expressed in the form $\frac{p}{q}$ where p and q are integer and $q \neq 0$

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9. Show that $0.2353535... = 0.\overline{235}$ can be expressed in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$

10. Find an irrational number between $\frac{1}{7}$ and $\frac{2}{7}$

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11. Visualize the representation of 5. $3\overline{7}$ on the

number line up to 5 decimal places, that is, up

to 5.37777.





are irrational numbers or not.



13. Add $2\sqrt{2} + 5\sqrt{3}$ and $\sqrt{2} - 3\sqrt{3}$

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14. Multiply $6\sqrt{5}$ by $2\sqrt{5}$.



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

17. Simplify the following expressions.

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

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18. Simplify the following expressions.

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

19. Simplify the following expressions. $\left(\sqrt{11}-\sqrt{7}
ight)\left(\sqrt{11}+\sqrt{7}
ight)$ Watch Video Solution **20.** Rationalise the denominator of $rac{1}{\sqrt{2}}$ Watch Video Solution **21.** Rationalise the denominator of $rac{1}{2+\sqrt{3}}$ **Watch Video Solution**















6. Locate $\sqrt{3}$ on the number line.



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7. Represent $\sqrt{17}$ on the number line



8. Represent $\sqrt{13}$ on the number line



(3) 0. $\overline{547}$



10. Express the following number in the $\frac{p}{q}$ form. Where p and q are integers and $q \neq 0$,

 $0.\ \overline{64}$



11. Express the following number in the $rac{p}{q}$ form. Where p and q are integers and q
eq 0,

 $0.\ \overline{752}$



12. Express the following number in the $\frac{p}{q}$ form. Where p and q are integers and $q \neq 0$, 1. $\overline{34}$



13. Express the following number in the $rac{p}{q}$ form. Where p and q are integers and q
eq 0,

 $1.\ \overline{27}$

14. Express the following number in the $\frac{p}{q}$ form. Where p and q are integers and $q \neq 0$, 2. $\bar{8}$

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15. Express the following number in the $rac{p}{q}$ form. Where p and q are integers and q
eq 0,

 $3. \ \overline{52}$

16. Express the following number in the $\frac{p}{q}$ form. Where p and q are integers and $q \neq 0$, 4. $\overline{05}$



17. Express the following number in the $rac{p}{q}$ form. Where p and q are integers and q
eq 0,

 $3.\ \overline{68}$



18. Express the following number in the $\frac{p}{q}$ form. Where p and q are integers and $q \neq 0$, 2. $\overline{576}$



19. Obtain the decimal expansion of thefollowing numbers :

 $\frac{4}{11}$

20. Obtain	the	decimal	expansation	of the
following numbers :				
$\frac{5}{7}$				
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21. Obtain the decimal expansation of the

following numbers :

 $\frac{37}{110}$



23. Solve : $0.\overline{45} + 0.\overline{23}$

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24. Solve : 0. $\overline{36} + 0. \overline{28}$

25. Visualize 4.287 on the number line using

successive magnification.



26. Visualize 5. $\overline{37}$ up to 4 decimal places on

the number line using successive

magnifications.

27. Visualise 2. 63 up to 4 decimal places on the number line using seccessive magnifications.

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28. Simplify : $5\sqrt{8} - 2\sqrt{32} - 2\sqrt{2}$

29. Simplify : $\left(4\sqrt{3} - 3\sqrt{5}\right)^2$





31. Rationalise the denominator of each of the

following expressions :

16

 $\sqrt{41-5}$



33. Rationalise the denominator of each of the

folloowing expressions :

 $\frac{30}{5\sqrt{3}-3\sqrt{5}}$

34. Rationalize the denominator of each of the

following expressions :

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

 $6+4\sqrt{2}$

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35. Rationalize the denominator of each of the

following expressions :

$$\frac{1}{7+3\sqrt{2}}$$

36. Rationalize the denominator of each of the

following expressions :

$$\frac{b^2}{\sqrt{a^2+b^2+a}}$$



37. Rationalize the denominator and simplify:

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

38. Rationalize the denominator and simplify:

 $\frac{4\sqrt{3}+5\sqrt{2}}{4\sqrt{3}+3\sqrt{2}}$

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39. Rationalize the denominator and simplify:

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

40. If the $x=8+3\sqrt{7}$, find the value of $x^2+rac{1}{x^2}$.

41. If the
$$x = 5 + 2\sqrt{6}$$
 find the value of $x^2 + \frac{1}{x^2}$ and $x^3 + \frac{1}{x^3}$
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42. If
$$p = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$$
 and $q = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$,
find the value of $p^2 + q^2$.
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43. If $x = 2 + \sqrt{3}$. find the value of $x^3 + \frac{1}{x^3}$
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44. If $x = 4 + \sqrt{15}$. Find the value of $x^2 + \frac{1}{x^2}$ and $x^3 + \frac{1}{x^3}$





47. Simplify

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

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48. Simplify: $\frac{5+\sqrt{3}}{7-4\sqrt{3}} - \frac{5-\sqrt{3}}{7+4\sqrt{3}}$ Watch Video Solution

49. If
$$a+8\sqrt{5}b=rac{8+\sqrt{5}}{8-\sqrt{5}}, ext{ find } a ext{ and } b$$
 ,




55. If
$$x = 5$$
 and $y = 2$ find the values of :
 $(x^x + y^y)^{-1}$
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56. Simplify:
$$\left[5^2 \left(8^{\frac{1}{3}} + 27^{\frac{1}{3}}\right)^3\right]^{\frac{1}{5}}$$

57. Evaluate :
$$\left(-\frac{1}{27}\right)^{-\frac{2}{3}}$$

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58. Evaluate :
$$3(40)^{\frac{1}{3}} - 4(320)^{\frac{1}{3}} - (5)^{\frac{1}{3}}$$

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59. Simplify :
$$\frac{(25)^{\frac{3}{2}} \times (343)^{\frac{1}{5}}}{16^{\frac{5}{4}} \times 8^{\frac{4}{3}} \times 7^{\frac{3}{5}}}$$



61. If
$$a=rac{\sqrt{3}}{7}$$
 and $rac{7}{a}=b\sqrt{3}$, then find the

value of b.

62. If
$$(4)^{2x-1} - (16)^{x-1} = 384$$
. find the

value of x .

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63. Prove that the result :

$$\left(rac{2^a}{2^b}
ight)^{a+b} imes \left(rac{2^b}{2^c}
ight)^{b+c} imes \left(rac{2^c}{2^a}
ight)^{c+a}=1$$

64. Write the following in the ascending order

of their magnitude:

$$\sqrt{3}, \quad {}^3\sqrt{4}, \quad {}^4\sqrt{6}$$

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65. If
$$\left(\frac{3}{4}\right)^6 imes \left(\frac{16}{9}\right)^5 = \left(\frac{4}{3}\right)^{x+2}$$
 find the

value of x.

Exercise 11

1. Is zero a rational number ? Can you write it in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$?

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2. Find six rational numbers between 3 and 4.

3. Find any five rational numbers between
$$\frac{3}{5}$$
 and $\frac{4}{5}$.

4. Statement whether the following statement are true or false. Give reasons for your answers :

- (i) Every natural number is a whole number.
- (ii) Every integer is a whole number.
- (iii) Every rational number is a whole number.



Exercise 1 2

1. Statement whether the following statement are true or false. Justify your answer. (i) Every irrational number is a real number. (ii) Every point on the number line is of the form \sqrt{m} . where m is a natural number. (iii) Every real number is an irrational number.

2. Are the square roots of all positive integers irrational ? If not. Give an example of the square root of a number that is a rational number.



3. Show how $\sqrt{5}$ can be represented on the

number line.







Exercise 13

1. Write the following in decimal and say what

kind of decimal expansion each has :

36 100

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2. Write the following in decimal and say what

kind of decimal expansion each has :



4. Write the following in decimal and say what kind of decimal expansion each has :



6. Write the following in decimal and say what

kind of decimal expansion each has :

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7. You know that $\frac{1}{7} = 0.$ $\overline{142857}$. Can you predict what the decimal expansions of $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}, \frac{6}{7}$ are, without actually doing the long division? If so , how ?

8. Express the following in the form $\frac{p}{q}$ where p and q integers and $q \neq 0$ 0. 66.



9. Express the following in the form $\frac{p}{q}$ where p and q integers and $q \neq 0$

 $0.\overline{47}$

10. Express the following in the form $\frac{p}{q}$ where

p and q integers and q
eq 0

 $0.\ \overline{001}$

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11. Express 0.999999.... in the form $\frac{p}{q}$, Are you surprised by your answer? With your teacher and classmates discuss why the answer makes

sense.

12. What can the maximum number of digits be in the repeating block of digits in the decimal expansion of $\frac{1}{17}$? Performs the division to check your answer.

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13. Look at several examples of rational numbers in the form $\frac{p}{q}$, $[q \neq 0]$ where p and q are integers with no common factors other then 1 and having terminating decimal

representations (expansions). Can you guess

what property q must satisfy?



14. Write three numbers whose decimal expansions are non-terminating non-recurring.



15. Find three different irrational numbers. Between the rational numbers $\frac{5}{7}$ and $\frac{9}{11}$.

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16. Classify the following numbers as rational or irrational :



17. Classify the following numbers as rational

or irrational :

 $\sqrt{225}.$



18. Classify the following numbers as rational

or irrational :

0.3796

19. Classify the following numbers as rational or irrational :

7.478478....

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20. Classify the following numbers as rational

or irrational :

1.101001000100001.....

1. Visualise 3.765 on the number line, using

successive magnifications.



2. Visualise 4. $\overline{26}$ on the numer line, up to 4

decimal places



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Exercise 15

1. Classify the following numbers as rational or

irrational:

$$2-\sqrt{5}$$

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2. Classify the following numbers as rational or

irrational:

$$\left(3+\sqrt{23}
ight)-\sqrt{23}$$

3. Classify the following numbers as rational or

irrational:

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



4. Classify the following numbers as rational

or irrational:



5. Classify the following numbers as rational or

irrational:

 2π



6. Simplify each of the following expressions :

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

7. Simplify each of the following expressions :

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

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8. Simplify each of the following expressions : $\left(\sqrt{5}+\sqrt{2}
ight)^2$

9. Simplify each of the following expressions :

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

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10. Recall , π is defined as the ratio of the circumference (say c) of a circle to its diameter (say d) . That is , $\pi = \frac{c}{d}$. This seems to contradict the fact that π is irrational . How will you resolve this contradiction ?



12. Rationalize the denominators or the

following

$$rac{1}{\sqrt{7}-\sqrt{6}}$$



14. Rationalize the denominators or the

following

$$rac{1}{\sqrt{7}-2}$$

Exercise 16

1. Find

 $64^{\frac{1}{2}}$

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2. Find

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

3. Find

 $125^{rac{1}{3}}$



4. Find :

 $9^{\frac{3}{2}}$

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5. Find

 $32^{rac{2}{5}}$





9. Simplify :



10. Simplify :

 $\frac{11^{\frac{1}{2}}}{11^{\frac{1}{4}}}$

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11. Simplify :

$$7^{rac{1}{2}}\cdot 8^{rac{1}{2}}$$

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Multiple Choice Questions Mcqs



Answer: B
- 2. The $\frac{p}{q}$ form of 3. $\overline{123}$ is A. $\frac{3120}{999}$ B. $\frac{3123}{1000}$ C. $\frac{1546}{495}$ A. $\frac{3123}{123}$
 - D. $\frac{3123}{990}$

Answer: C



3. The $\frac{p}{q}$ form of 2. $\overline{237}$ is

A.
$$\frac{2235}{999}$$

B. $\frac{2235}{99}$
C. $\frac{2235}{99}$
C. $\frac{2237}{990}$
D. $\frac{2237}{1000}$



4. The decimal expression of $\frac{5}{6}$ is

A. non - terminating recurring

B. non - terminating non- recurring

C. undeterminate

D. terminating

Answer: A

5. $\left(\sqrt{3}+\sqrt{2}\right)\left(\sqrt{3}-\sqrt{2}\right)=\ldots\ldots$

A. $\sqrt{3}$

 $\mathsf{B.}\,\sqrt{2}$

C. 5

D. 1

Answer: D



6. $6\sqrt{20} + 2\sqrt{5}$ =.....

A. 6

- B. 3
- C. $3\sqrt{5}$
- D. $14\sqrt{5}$

Answer: A

7. $\frac{\sqrt{48}}{\sqrt{27}}$ is a/an

A. irrational number

B. negative integer

C. positive integer

D. rational number

Answer: D

8.
$$(2^{-2})^{-3} = \dots$$

A. 8^2

 $\mathbf{B.}\,8^4$

 $\mathsf{C}.\,15^2$

D. 15^{4}



9. $5^{\frac{9}{5}} \times 5^{\frac{1}{5}} = \dots$

A. 5

 $\mathsf{B.}\,5^4$

 $C. 5^{3}$

 $\mathsf{D.}\,5^2$



10.are equivalent rational numbers.

A.
$$\frac{26}{39}$$
 and $\frac{51}{34}$
B. $\frac{33}{22}$ and $\frac{65}{52}$
C. $\frac{14}{21}$ and $\frac{27}{18}$
D. $\frac{63}{42}$ and $\frac{69}{46}$

Answer: D

11. Is a rational number between 5 and 6.

A.
$$\frac{17}{4}$$

B. $\frac{17}{3}$
C. $\frac{17}{2}$
D. $\frac{13}{2}$

Answer: B

12. The $\frac{p}{q}$ form of $0.\ \overline{35}$ is

A.
$$\frac{16}{45}$$

B. $\frac{35}{9}$
C. $\frac{35}{99}$
D. $\frac{35}{90}$



13.

Since

$$\frac{2}{7} = 0.\ \overline{285714}, \frac{6}{7} = \dots$$

A. 0. $\overline{571428}$

B. 0. $\overline{142857}$

$\mathsf{C.}\, 0.\,\,\overline{857142}$

D. 0. $\overline{428571}$

Answer: C

14. $\sqrt{1} + \sqrt{4}$ is a/an

A. natural number

B. irrational number

C. negative number

D. fractional number



15. $\sqrt{2} + \sqrt{2}$ is a/ an

A. integer

B. irrational number

C. rational number

D. whole number

Answer: B

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16. $2\sqrt{18} + \sqrt{50}$ is a/an

A. integer

B. rational number

C. whole number

D. irrational number

Answer: B

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17.
$$\left(\sqrt{3}-\sqrt{2}
ight)^2$$
 is a / an Number.

A. natural

B. irrational

C. rational

D. whole

Answer: B





it should be multiplied by

A.
$$\displaystyle rac{5}{2-\sqrt{3}}$$

B. $\displaystyle rac{5}{\sqrt{3}-2}$

C.
$$rac{2+\sqrt{3}}{2+\sqrt{3}}$$

D. $rac{2-\sqrt{3}}{5}$

Answer: C



19.
$$\frac{3}{5+2\sqrt{2}}$$
 will be expressed as With

rationalize of the denominator.

A.
$$rac{15-6\sqrt{2}}{17}$$

B. $rac{15+6\sqrt{2}}{17}$

C.
$$\frac{15+6\sqrt{2}}{33}$$

D. $\frac{15-6\sqrt{2}}{33}$

Answer: C

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20. If
$$\sqrt{a^2} = b$$
, then b^{2n} =

 $(a,b>0,\;n$ is a natural number)

A. a

 $\mathsf{C}.\,a^{2n}$

 $\mathsf{D.}\,a^4$

Answer: D

