



# MATHS

# BOOKS - VIDHYASANGAM - RAO'S ACADEMY MATHS (KANNADA ENGLISH)

# NUMBER SYSTEM



**1.** 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

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**2.** Show that  $\sqrt{5}$  can be represented on the

number line

### 3. Rationalise the denominators of the

### following

$$\frac{1}{9-\sqrt{2}}$$



### Exercise 13

### 1. write the following in decimal form and say

what kind of decimal expansion each has:

 $\frac{36}{100}$ 



2. write the following in decimal form and say what kind of decimal expansion each has:  $\frac{1}{11}$ 

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# 3. write the following in decimal form and say

what kind of decimal expansion each has:



4. write the following in decimal form and say

what kind of decimal expansion each has:

 $\frac{3}{13}$ 



# 5. write the following in decimal form and say

what kind of decimal expansion each has:

 $\frac{2}{11}$ 



6. write the following in decimal form and say

what kind of decimal expansion each has:

 $\frac{329}{400}$ 

7. you know that  $\frac{1}{7} = 0$ .  $\overline{142857}$  can you predict what the decimal expansion 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 [hint : study the



9. Express the following in the form of  $rac{p}{q}$  where p and q are integers and q 
eq 0 $0.4ar{7}$ 



**10.** Express the following in the form of  $\frac{p}{q}$  where p and q are integers and  $q \neq 0$ 

 $0.\ \overline{001}$ 



**11.** Express 0.9999.... 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  $\frac{1}{17}$  ?

13. Look at several example of rational numbers in the form  $\frac{p}{q}$  where p and q are integers with no common factors other than 1 and having terminating decimal representations (expansions) can you guess what property q must satisfy? Watch Video Solution

**14.** write three numbers whose decimal expansions are non-terminating non recuring





16. Classify the following numbers as rational

or irrational



1. Visualise 3.765 on the number line using

successive magnification

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**2.** Visualise 4.  $\overline{26}$  on the number line upto 4

decimal places

# 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

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

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# **4.** Classify the following numbers as rational

or irrational



# **5.** Classify the following numbers as rational or irrational

 $2\pi$ 

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# 6. Simplify the following expressions:

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

7. Simplify the following expressions:

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



**8.** Simplify the following expressions:

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

**9.** Simplify the following expressions:

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

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**10.** Real  $\pi$  is defined as the ratio of the circumference (say c) of a circle to its diameter (say d) i.e  $\pi = \frac{c}{d}$  this seems to contradict the fact that  $\pi$  is irrational how will you resolve this contradication ?



12. Rationalise the denominators of the

following

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



### 14. Rationalise the denominators of 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

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





 $\frac{1}{\left(3^3\right)^7}$ 

### **10.** Simplify

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

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### **11.** Simplify

$$\left(7^{rac{1}{2}}.8^{rac{1}{2}}
ight)$$