

21 Dec '24

$$\begin{array}{c} \overline{11} \\ \overline{10} \\ = 1 \cdot 1 \\ = 1 + 0 \cdot 1 \\ = 1 + \frac{1}{10} \end{array} \qquad \begin{array}{r} 1 \\ 10 \sqrt{11} \\ \underline{-10} \\ \hline 1 \end{array} \qquad \left. \begin{array}{l} q=1, \text{ remainder}=1 \\ -1 \quad \frac{1}{10} \end{array} \right\} \begin{array}{l} \frac{11}{10} = \frac{(10+1)}{10} \\ = \frac{10}{10} + \frac{1}{10} \\ = 1 + \frac{1}{10} \\ = 1 + 0 \cdot 1 \end{array}$$

Whether you do decimal division, or fractions (proper/improper/mixed) or integers division, the answers should all be equal.  
(or use right distributive law for division).

→ Don't try to remember the formula  
to convert Improper to mixed fractions;  
Instead, think about how you get  
that formula

$$\frac{\text{dividend}}{\text{divisor}} = \underline{\text{quotient}} \ \ \frac{\text{remainder}}{\text{divisor}}$$

For  $\frac{11}{2}$ , Integer division just gives you quotient (5)

Decimal division gives you = (5.5)

Mixed fraction gives you  $5\frac{1}{2} = 5 + \frac{1}{2}$

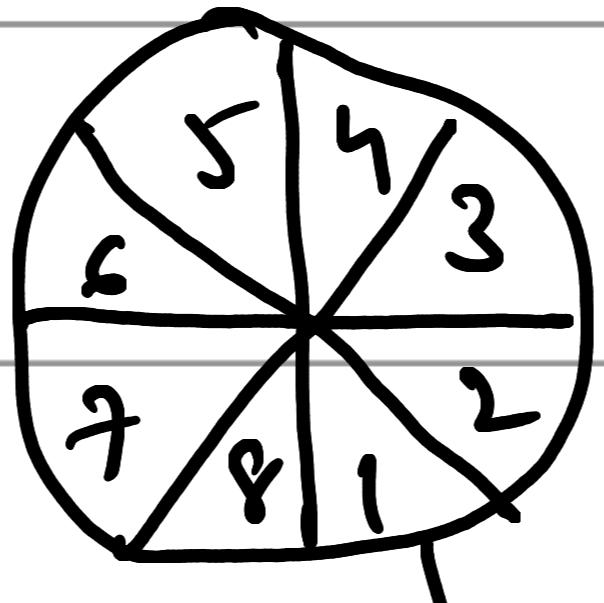
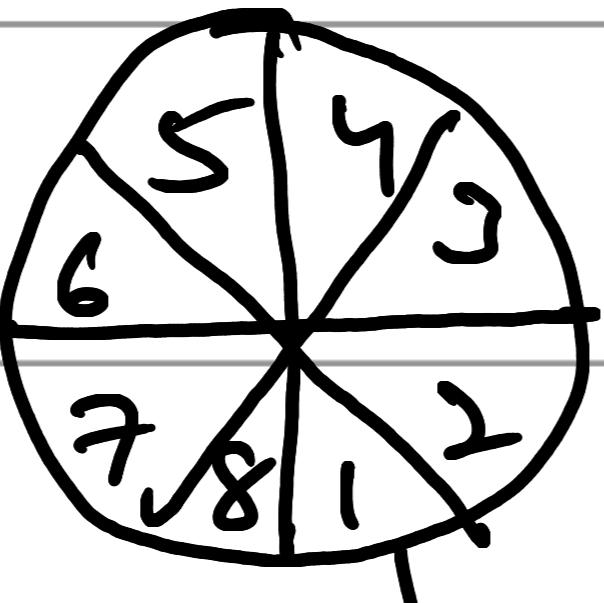
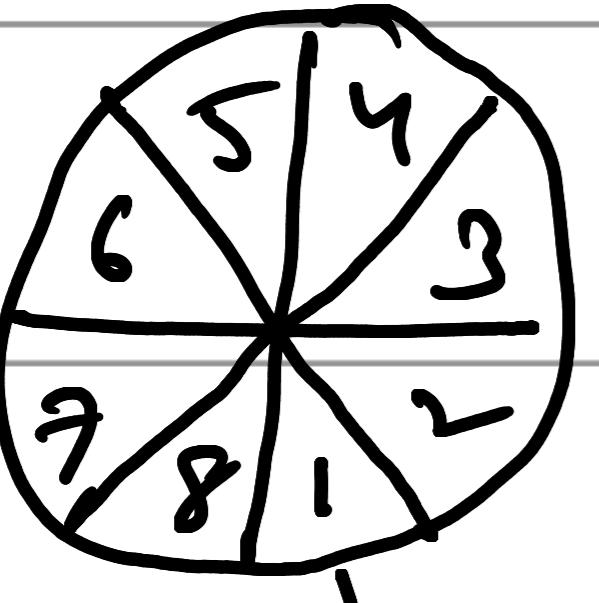
$$= 5 + 0.5$$

$$= 5.5$$

→ What does  $\frac{3}{8}$  mean?

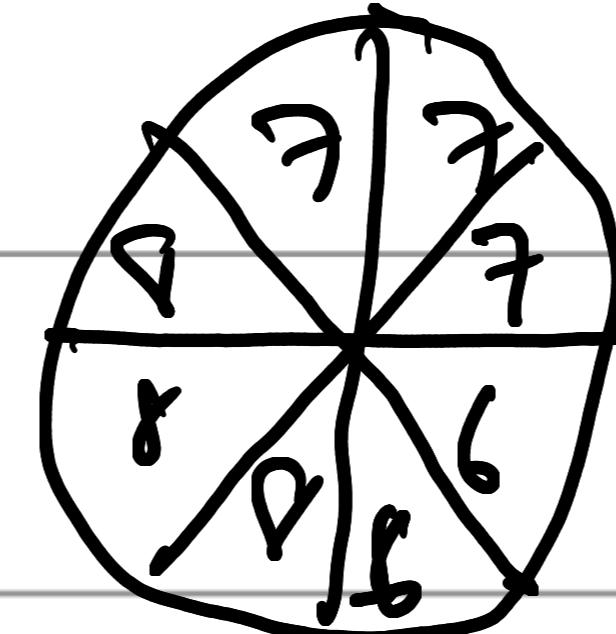
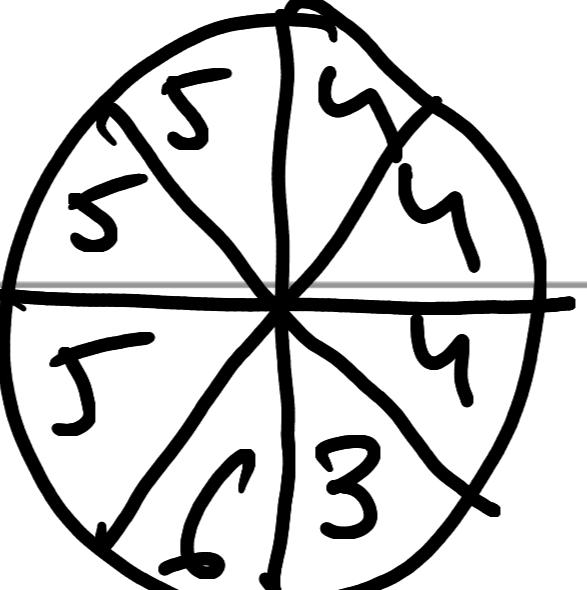
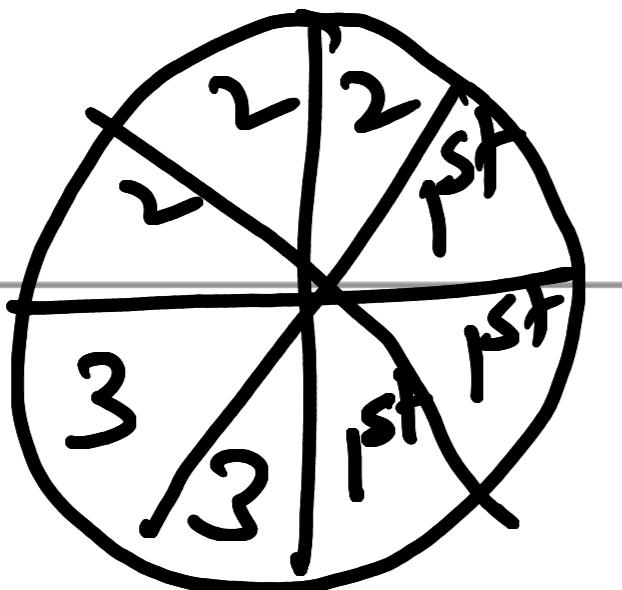
3 pizzas to be split among 8 people.

(Solution 1)



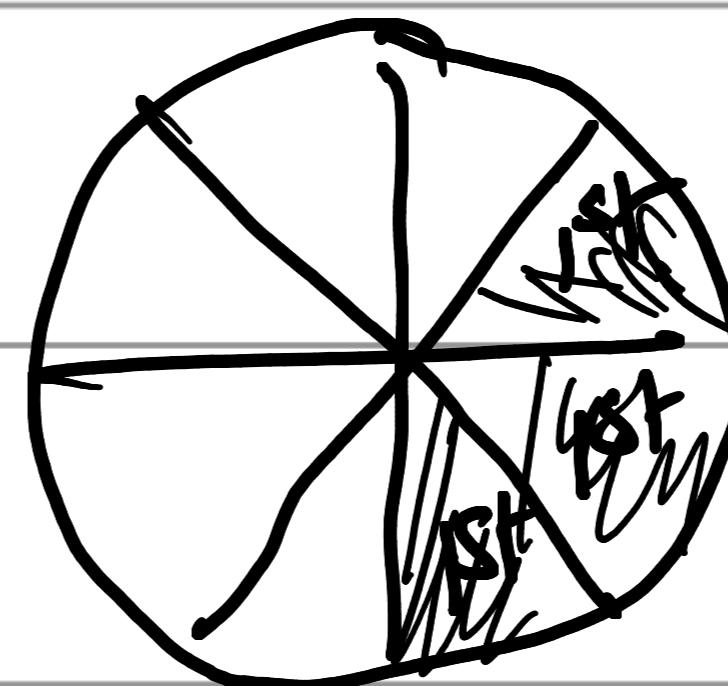
Divide each pizza into 8 pieces, and give one slice from each pizza to each person

(Solution 2)



Each person gets 3 slices but in a different order.

Each person is getting 3 '8th parts'  
of a pizza.



$$= \frac{3}{8} \text{ of a pizza}$$

three-eighth of

a pizza.

Convert mixed to improper fraction:

Another way

$$\begin{aligned} 3\frac{1}{3} &= 3 + \frac{1}{3} = \frac{3}{1} + \frac{1}{3} = \frac{3 \times 3 + 1 \times 1}{3} = \frac{10}{3} \\ &= \frac{3 \times 3 + 1 \times 1}{3 \times 1} = \frac{10}{3} \end{aligned}$$

Unlike fractions

quotient      remainder  
                divisor

$14\frac{3}{7}$

$$= \frac{\text{quotient}}{1} \times \frac{\text{divisor}}{\text{divisor}} + \frac{\text{remainder}}{\text{divisor}} \times \frac{1}{1}$$

$$= \text{quotient} \times \text{divisor} + \text{remainder}$$

$$\frac{\text{dividend}}{\text{divisor}}$$

→ Why is  $\frac{a}{b} \times \frac{c}{d} = \frac{axc}{bxd}$ ?

Check with simple examples

Eg:

$$\frac{4}{2} \times \frac{6}{3}$$

$$(4/2) \times (6/3)$$

$$\frac{4 \times 6}{2 \times 3}$$

$$= 2 \times 2$$

$$= \frac{24}{6}$$

$$= 4$$

$$= 4$$

→ Why is  $\frac{a}{b} \div \frac{c}{d} = \frac{axd}{bxc}$ ?

Eg:

$$\frac{4}{2} \div \frac{6}{3}$$

$$\frac{4 \times 3}{2 \times 6}$$

$$= 2 \div 2$$

$$\frac{12}{12}$$

$$= 1$$

$$= 1$$

Eg:

$$4 \div \frac{1}{4}$$

$$\frac{4}{1} \times \frac{4}{1}$$

$$= 4 \div 0.25$$

$$= 16$$

$$= \frac{400}{25}$$

$$= 16$$

$\frac{4}{1} \rightarrow$  4 chocolates among 1 person, so each person gets 4 chocolates.

$\frac{4}{4} \rightarrow$  4 chocolates among 4 persons, so each person gets 1 chocolate

$\frac{4}{(\frac{1}{4})} \rightarrow$  4 chocolates to  $(\frac{1}{4})^{\text{th}}$  part of a person (like head)  
so the whole person gets  $4 \times 4 = 16$ ' chocolates  
Head, Neck, Stomach, Legs each getting 4.

## ⇒ Multiplication of fractions:

$$\frac{3}{5} \times \frac{4}{6} = \frac{3 \times 4}{5 \times 6}$$

$$\frac{3}{5} \times \frac{4}{6} \times \frac{7}{9} \times \frac{11}{43} = \left( \frac{3 \times 4}{5 \times 6} \right) \times \frac{7}{9} \times \frac{11}{43}$$

$$= \frac{(3 \times 4 \times 7)}{(5 \times 6 \times 9)} \times \frac{11}{43}$$

$$= \frac{3 \times 4 \times 7 \times 11}{5 \times 6 \times 9 \times 43}$$

(Since multiplication is associative)

$$\frac{a}{b} \times \frac{c}{d} \times \frac{e}{f} \times \frac{g}{h} \times \dots = \frac{a \times c \times e \times g \times \dots}{b \times d \times f \times h \times \dots}$$

$\Rightarrow$  Subtraction of fractions :

$$\begin{aligned} \frac{5}{3} - \frac{6}{4} &= \frac{5}{3} + \left( -\frac{6}{4} \right) = \frac{5}{3} \times \frac{1}{4} + \left( -\frac{6}{4} \right) \times \frac{3}{3} \\ &= \frac{5 \times 4 - 6 \times 3}{3 \times 4} \end{aligned}$$

$$\frac{5 \times 4}{3 \times 4} - \frac{6 \times 3}{4 \times 3} = \frac{5 \times 4 - 6 \times 3}{3 \times 4}$$

Similar to addition

→ When you forget some formula or rule, try with simple examples and check.

HW: (1) Study everything we learnt so far & practice with your own examples, verify with a different method, also using calculator.  
(2) Learn how each piece on a chess board moves and the names of pieces in English & Telugu