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FRACTIONS
1-20

1 Q) What is a Fraction ?

A) A Fraction is a small part, an amount less than the whole, a portion, Non-Integer quantity expressed in terms of a Numerator and Denominator.

2 A Fraction is the Quotient of one number, or expression, divided by another, indicated by $\frac{a}{b}$.

3 The Dividend a, is the Numerator and the Non-Zero Divisor b, is the Denominator.

4 There are 5 Classifications of Fractions; Common, Complex, Proper, Improper and Mixed.

5 For Common Fractions, also called Simple and Vulgar Fractions, the Numerator and Denominator are both Integers.

6 For Complex Fractions, the Numerator and Denominator are themselves Fractions.

7 For Proper Fractions, the Numerator is Less Than the Denominator.

8 For Improper Fractions, the Numerator is Greater Than the Denominator.

9 A Mixed Number Fraction is an Integer written next to a Fraction, such as One and One-Half, $1\frac{1}{2}$.

10 Q) What is a Ratio ?
A) A Ratio is the Quotient of two numbers indicating their Relative Sizes. The Ratio of a to b is written as a:b or a/b or $\frac{a}{b}$.

11 The Value of the Ratio is unaltered if both terms are Multiplied or Divided by the Same Quantity.

12 A Unitary Ratio has one of its terms Equal to 1.

13 The Ratio Notation can be extended to indicate the Relative Size of more than two Quantities. For example, the Ratio a:b:c states that the Ratios of the First to the Second Quantity, the Second to the Third, and the First to the Third are Equivalent to a:b, b:c, and a:c .

14 Thus the Quantities 25, 50 and 75 are in the Ratio 1:2:3 .

15 Fractions are Short-Hand Notation for Division.

16 To Add Fractions, 1st be sure the fractions have the same Denominator. If the denominators are Different, find the Least Common Denominator (LCD) and Re-Write the Fractions as Equivalent Fractions. Then Add the Numerators together while

keeping the Denominator the Same. Finally, Simplify the Fraction if possible.

17 For Fractions with the Same Denominator use :

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

18 For Fractions with Different Denominators use :

$$\frac{a}{c} + \frac{b}{d} = \frac{a\,d}{cd} + \frac{bc}{cd} = \frac{ad+bc}{cd}$$

19 To Multiply Fractions, Multiply the Numerators together (Top) and Multiply the Denominators together (Bottom). After Multiplying, Simplify the Resulting Fraction if possible by Dividing the Numerator and Denominator by their Greatest Common Factor(GCF). Whole Numbers can be written as Fractions with a Denominator of 1 before Multiplying. Use :

$$\frac{a}{c} * \frac{b}{d} = \frac{ab}{cd} \quad \textbf{or} \quad \frac{a}{d} * \frac{b}{e} * \frac{c}{f} = \frac{abc}{def}$$

20 To Divide two Fractions, Multiply by the Reciprocal of the Divisor.

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} * \frac{d}{c} = \frac{ad}{bc}$$