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classmate

Date _____

Page _____

Ch-3
Exercise 3.8

Q. 1 Let the numerator and the denominator be x and y .

ATQ,

$$x = y - 4 \quad \text{--- (1)}$$

$$8(x-2) = (y+1)$$

$$8x - 16 = y + 1$$

$$8x - y = 16 + 1$$

$$8x - y = 17 \quad \text{--- (2)}$$

Putting value of y in (2)

~~$$8x - y = 17$$
$$8(x-4) - y = 17$$
$$y - 4 - y = 17$$~~

$$8x - y = 17$$

$$8x - (x+4) = 17$$

$$8x - x - 4 = 17$$

$$7x = 17 + 4$$

$$7x = 21$$

$$\boxed{x = 3}$$

Putting value of x in (1)

$$x = y - 4$$

$$y = x + 4$$

$$y = 3 + 4$$

$$\boxed{y = 7}$$

$$\therefore \text{Fraction} = \frac{x}{y} = \boxed{\frac{3}{7}}$$

Q.3 Let the numerator and the denominator be x and y .

ATQ,

$$\frac{x-1}{y-1} = \frac{1}{3}$$

$$3x-3 = y-1$$

$$3x-y = -1+3$$

$$3x-y = 2 \quad \text{————— (1)}$$

$$\frac{x+1}{y+1} = \frac{1}{2}$$

$$2x+2 = y+1$$

$$2x-y = 1-2$$

$$2x-y = -1 \quad \text{————— (2)}$$

Subtract (2) from (1)

$$3x-y = 2$$

$$2x-y = -1$$

$$\begin{array}{r} (-) \quad (+) \quad (+) \\ \hline x = 3 \end{array}$$

Putting value of x in (1)

$$3x-y = 2$$

$$3(3)-y = 2$$

$$y = 9-2$$

$$y = 7$$

$$\text{Fraction} = \frac{3}{7}$$

Q.5 Let the numerator and the denominator be x and y .

ATQ,

$$x+y = 12 \quad \text{————— (1)}$$

$$\frac{x}{y+3} = \frac{1}{2}$$

$$2x = y + 3$$

$$2x - y = 3 \quad \text{--- (2)}$$

Add ① and ②,

$$\begin{array}{r} x + y = 12 \\ (+) 2x - y = 3 \\ \hline 3x = 15 \\ \hline x = 5 \end{array}$$

Putting value of x in ①,

$$\begin{array}{r} x + y = 12 \\ y = 12 - 5 \\ \hline y = 7 \end{array}$$

$$\text{Fraction} = \boxed{\frac{5}{7}}$$

Q.6 Let the numerator and the denominator be x and y .

ATQ,

$$\frac{x-2}{y+3} = \frac{1}{4}$$

$$4x - 8 = y + 3$$

$$4x - y = 8 + 3$$

$$4x - y = 11 \quad \text{--- (1)}$$

$$\frac{x+6}{3y} = \frac{2}{3}$$

$$3x + 18 = 6y$$

$$3x - 6y = -18$$

$$x - 2y = -6 \quad \text{--- (2)}$$

Multiply ① by 2.

$$8x - 2y = 22 \quad \text{--- (3)}$$

Subtract ② from ③

$$\begin{array}{r} 8x - 2y = 22 \\ x - 2y = -6 \\ \hline (-) \quad (+) \quad (+) \\ 7x = 28 \\ \boxed{x = 4} \end{array}$$

Putting value of x in ①

$$\begin{array}{r} 4x - y = 11 \\ 4(4) - y = 11 \\ 16 - y = 11 \\ \boxed{y = 5} \end{array}$$

$$\text{Fraction} = \frac{x}{y} = \frac{4}{5}$$

Let the numerator and the denominator be x and y .

ATQ,

$$\begin{array}{r} x + y = 2x + 4 \\ x - 2x + y = 4 \\ -x + y = +4 \\ x - y = -4 \quad \text{--- ①} \end{array}$$

$$\frac{x+3}{y+3} = \frac{2}{3}$$

$$\begin{array}{r} 3x + 9 = 2y + 6 \\ 3x - 2y = 6 - 9 \\ 3x - 2y = -3 \quad \text{--- ②} \end{array}$$

Multiply ① by 2.

$$2x - 2y = -8 \quad \text{--- ③}$$

Subtract ② from ③,

$$\begin{array}{r} 2x - 2y = -8 \\ 3x - 2y = -3 \\ (-) \quad (+) \quad (+) \end{array}$$

$$\begin{array}{r} +x = +5 \\ \boxed{x = 5} \end{array}$$

Putting value of x in ①,

$$x - y = -4$$

$$5 - y = -4$$

$$\boxed{y = 9}$$

$$\therefore \text{Fraction} = \frac{x}{y} = \boxed{\frac{5}{9}}$$

Q. 10 Let the numerator and the denominator be x and y .

ATQ,

$$x + y = 2x + 4$$

$$x - 2x + y = 4$$

$$-x + y = 4$$

$$x - y = -4$$

$$x = y - 4 \quad \text{--- ①}$$

$$\frac{x+3}{y+3} = \frac{2}{3}$$

$$3x + 9 = 2y + 6$$

$$3x - 2y = 6 - 9$$

$$3x - 2y = -3 \quad \text{--- ②}$$

Putting value of x in ②,

$$\begin{aligned} 3x - 2y &= -3 \\ 3(y - 4) - 2y &= -3 \\ 3y - 12 - 2y &= -3 \\ y &= -3 + 12 \\ \boxed{y} &= \boxed{9} \end{aligned}$$

Putting value of y in ①

$$\begin{aligned} x &= y - 4 \\ x &= 9 - 4 \\ \boxed{x} &= \boxed{5} \end{aligned}$$

$$\therefore \text{Fraction} = \frac{5}{9}$$

Q. 11 Let the numerator and the denominator be x and y .

ATQ,

$$\begin{aligned} \frac{2x}{y-5} &= \frac{6}{5} \\ 10x &= 6y - 30 \\ 10x - 6y &= -30 \\ 5x - 3y &= -15 \quad \text{--- ①} \end{aligned}$$

$$\begin{aligned} \frac{x+8}{2y} &= \frac{2}{5} \\ 5x + 40 &= 4y \\ 5x - 4y &= -40 \quad \text{--- ②} \end{aligned}$$

Subtract ① from ②

$$\begin{aligned} 5x - 4y &= -40 \\ 5x - 3y &= -15 \\ (-) \quad (+) \quad (+) & \\ \hline +y &= +25 \\ \boxed{y} &= \boxed{25} \end{aligned}$$

Putting value of y in ①,

$$\begin{aligned} 5x - 3y &= -15 \\ 5x - 3(25) &= -15 \\ 5x &= -15 + 75 \\ x &= \frac{60}{5} \Rightarrow \boxed{x} = \boxed{12} \end{aligned}$$

$$\therefore \text{Fraction} = \frac{12}{25}$$

Q.12 Let the numerator and the denominator be x and y .

ATQ,

$$\begin{aligned} x+y &= 2y-3 \\ x+y-2y &= -3 \\ x-y &= -3 \quad \text{--- ①} \end{aligned}$$

$$x-1 = \frac{1}{2}(y-1)$$

$$2x-2 = y-1$$

$$2x-y = 2-1$$

$$2x-y = 1 \quad \text{--- ②}$$

Subtract ① from ②,

$$\begin{array}{r} 2x-y = 1 \\ x-y = -3 \\ \hline (-) (+) (+) \\ \hline x = 4 \end{array}$$

Putting value of x in ①,

$$\begin{array}{r} x-y = -3 \\ 4-y = -3 \\ \hline 4+y = 1 \\ \hline y = 7 \end{array}$$

$$\therefore \text{Fraction} = \frac{4}{7}$$