EXERCISE 1.1

Q.1 Write the following quadratic equations in the Standard form and point out pure quadratic equations.

(i) $(x+7)(x-3)=-7$

Solution: $(x+7)(x-3)=-7$

$$x^2-3x+7x-21=-7$$

$$x^2+4x-21+7=0$$

$$x^2+4x-14=0$$

The standard form of quadratic equation is:

$$x^2+4x-14=0$$

(ii) $\dfrac{x^2+4}{3}-\dfrac{x}{7}=1$

Solution: $\dfrac{x^2+4}{3}-\dfrac{x}{7}=1$

$$\frac{7(x^2+4)-3x}{21}=1$$

$$7x^2+28-3x=21$$

$$7x^2-3x+28-21=0$$

$$7x^2-3x+7=0$$

The standard form of quadratic equation is:

$$7x^2-3x+7=0$$

(iii) $\dfrac{x}{x+1}+\dfrac{x+1}{x}=6$

Solution: $\dfrac{x}{x+1}+\dfrac{x+1}{x}=6$

$$\frac{x^2+(x+1)^2}{x(x+1)}=6$$

$$x^2+x^2+1+2x=6x(x+1)$$

$$2x^2+2x+1=6x^2+6x$$

$$0=6x^2+6x-2x^2-2x-1$$

$$0=4x^2+4x-1$$

$$\Rightarrow \quad 4x^2+4x-1=0$$

The standard form of quadratic equation is:

$$4x^2+4x-1=0$$

(iv) $\left(\dfrac{x+4}{x-2}\right)-\left(\dfrac{x-2}{x}\right)+4=0$

Solution: $\left(\dfrac{x+4}{x-2}\right)-\left(\dfrac{x-2}{x}\right)+4=0$

$$\frac{(x+4)x-(x-2)^2+4x(x-2)}{(x-2)(x)}=0$$

$$x^2+4x-[x^2+2^2-2(x)(2)]+4x^2-8x=0$$

$$x^2+4x-x^2-4+4x+4x^2-8x=0$$

$$4x^2+4x+4x-8x-4=0$$

$$4x^2+8x-8x-4=0$$

$$4x^2-4=0$$

$$4(x^2-1)=0$$

$$\therefore \quad x^2-1=0 \quad (\because 4\neq 0)$$

So, $x^2-1=0$ is Pure Quadratic Equation

(v) $\dfrac{x+3}{x+4}-\dfrac{x-5}{x}=1$

Solution: $\dfrac{x+3}{x+4}-\dfrac{x-5}{x}=1$

$$\frac{x(x+3)-(x+4)(x-5)}{x(x+4)}=1$$

$$x^2+3x-(x^2-5x+4x-20)=1x(x+4$$

$$x^2+3x-(x^2-1x-20)=x^2+4x$$

$$x^2+3x-x^2+x+20=x^2+4x$$

$$3x+x+20=x^2+4x$$

$$4x+20=x^2+4x$$

$$\Rightarrow \quad x^2+4x-4x-20=0$$

$$x^2-20=0$$

$$x^2+0x-20=0$$

As, $b=0$

So, $x^2-20=0$ is Pure Quadratic Equation