Quadratic Equations Ex 8.1 Q1

Answer :

We are given the following algebraic expressions and are asked to find out which one is quadratic

(i) Here it has been given that,

$x^2+6x-4=0$

Now, the above equation clearly represents a quadratic equation of the form $ax^2+bx+c=0$, where $a=1$, $b=6$ and $c=-4$.

Hence, the above equation is a quadratic equation.

(ii) Here it has been given that,

$\sqrt{3}x^2-2x+\frac{1}{2}=0$

Now, solving the above equation further we get,

$\frac{2\sqrt{3}x^2-4x+1}{2}=0$

$2\sqrt{3}x^2-4x+1=0$

Now, the above equation clearly represents a quadratic equation of the form $ax^2+bx+c=0$, where $a=2\sqrt{3}$, $b=-4$ and $c=1$.

Hence, the above equation is a quadratic equation.

(iii) Here it has been given that,

$x^2+\frac{1}{x^2}=5$

Now, solving the above equation further we get,

$\frac{x^4+1}{x^2}=0$

$x^4+1=0$

Now, the above equation clearly does not represent a quadratic equation of the form $ax^2+bx+c=0$, because x^4+1 is a polynomial of degree 4.

Hence, the above equation is not a quadratic equation.

(iv) Here it has been given that,

$x-\frac{3}{x}=x^2$

Now, solving the above equation further we get,

$\frac{x^2-3}{x}=x^2$

$x^2-3=x^3$

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

Now, the above equation clearly does not represent a quadratic equation of the form $ax^2+bx+c=0$, because $-x^3+x^2-3$ is a polynomial of degree 3.

Hence, the above equation is not a quadratic equation.

(v) Here it has been given that,

$2x^2-\sqrt{3x}+9=0$

Now, the above equation clearly does not represent a quadratic equation of the form $ax^2+bx+c=0$, because $2x^2-\sqrt{3x}+9=0$ contains a term $x^{\frac{1}{2}}$, where $\frac{1}{2}$ is not an integer.

Hence, the above equation is not a quadratic equation.

(vi) Here it has been given that,

$x^2-2x-\sqrt{x}-5=0$

Now, as we can see the above equation clearly does not represent a quadratic equation of the form $ax^2+bx+c=0$, because $x^2-2x-\sqrt{x}-5=0$ contains an extra term $x^{\frac{1}{2}}$, where $\frac{1}{2}$ is not an integer.

Hence, the above equation is not a quadratic equation.

(vii) Here it has been given that,

$3x^2-5x+9=x^2-7x+3$

Now, after solving the above equation further we get,

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

$x^2+x+3=0$

Now as we can see, the above equation clearly represents a quadratic equation of the form $ax^2+bx+c=0$, where $a=1$, $b=1$ and $c=3$.

Hence, the above equation is a quadratic equation.

(viii) Here it has been given that,

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

Now, solving the above equation further we get,

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

$$x^2+1=x$$

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

Now as we can see, the above equation clearly represents a quadratic equation of the form $ax^2+bx+c=0$, where $a=1$, $b=-1$ and $c=1$.

Hence, the above equation is a quadratic equation.

(ix) Here it has been given that,

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

Now as we can see, the above equation clearly represents a quadratic equation of the form $ax^2+bx+c=0$, where $a=1$, $b=-3$ and $c=0$.

Hence, the above equation is a quadratic equation.

(x) Here it has been given that,

$$\left(x+\frac{1}{x}\right)^2=3\left(x+\frac{1}{x}\right)+4$$

Now, solving the above equation further we get,

$$\left(\frac{x^2+1}{x}\right)^2=\frac{3x^2+1+4x}{x}$$

$$x^4+1+2x^2=3x^3+x+4x^2$$

$$x^4-3x^3-2x^2-x+1=0$$

Now as we can see, the above equation clearly does not represent a quadratic equation of the form $ax^2+bx+c=0$, because $x^4-3x^3-2x^2-x+1$ is a polynomial having a degree of 4 which is never present in a quadratic polynomial.

Hence, the above equation is not a quadratic equation.

(xi) Here it has been given that,

$$(2x+1)(3x+2)=6(x-1)(x-2)$$

Now, after solving the above equation further we get,

$$6x^2+7x+2=6x^2-18x+12$$

$$25x-10=0$$

$$5x-2=0$$

Now as we can see, the above equation clearly does not represent a quadratic equation of the form $ax^2+bx+c=0$, because $5x-2=0$ is a linear equation.

Hence, the above equation is not a quadratic equation.

(xii) Here it has been given that,

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

Now, solving the above equation further we get,

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

$$x^2+1=x^3$$

$$-x^3+x^2+1=0$$

Now as we can see, the above equation clearly does not represent a quadratic equation of the form $ax^2+bx+c=0$, because $-x^3+x^2+1$ is a polynomial having a degree of 3 which is never present in a quadratic polynomial.

Hence, the above equation is not a quadratic equation.

(xiii) Here it has been given that,

$$16x^2-3=(2x+5)(5x-3)$$

Now, after solving the above equation further we get,

$$16x^2-3=10x^2+19x-15$$

$$4x^2-19x+12=0$$

Now as we can see, the above equation clearly represents a quadratic equation of the form $ax^2+bx+c=0$, where $a=4$, $b=-19$ and $c=12$.

Hence, the above equation is a quadratic equation.

(xiv) Here it has been given that,

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

Now, after solving the above equation further we get,

$$x^3+8+3(x)(2)(x+2)=x^3-4$$

$$12+6x^2+12x=0$$

$$x^2+2x+2=0$$

Now as we can see, the above equation clearly represents a quadratic equation of the form $ax^2+bx+c=0$, where $a=1$, $b=2$ and $c=2$.

Hence, the above equation is a quadratic equation.

(xv) Here it has been given that,

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

Now, solving the above equation further we get,

$$x^2+x+8=x^2-4$$
$$x+12=0$$

Now as we can see, the above equation clearly does not represent a quadratic equation of the form $ax^2+bx+c=0$, because $x+12=0$ is a linear equation which does not have a x^2 term in it.

Hence, the above equation is not a quadratic equation.

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