Quadratic Equations Ex 8.1 Q3

Answer :

In each of the following cases find *k*.

(i) We are given here that,

$7x^2+kx-3=0, x=\frac{2}{3}$

Now, as we know that $x=\frac{2}{3}$ is a solution of the quadratic equation, hence it should satisfy the equation. Therefore substituting $x=\frac{2}{3}$ in the above equation gives us,

$$7\left(\frac{2}{3}\right)^2+k\left(\frac{2}{3}\right)-3=0$$
$$\frac{28+6k-27}{3}=0$$
$$6k=-1$$
$$k=-\frac{1}{6}$$

Hence, the value of $\boxed{k=-\frac{1}{6}}$

(ii) We are given here that,

$x^2-x(a+b)+k=0, x=a$

Now, as we know that $x=a$ is a solution of the quadratic equation, hence it should satisfy the equation. Therefore substituting $x=a$ in the above equation gives us,

$$a^2-a(a+b)+k=0$$
$$a^2-a^2-ab+k=0$$
$$k=ab$$

Hence the value of $\boxed{k=ab}$

(iii) We are given here that,

$kx^2-\sqrt{2}x-4=0, x=\sqrt{2}$

Now, as we know that $x=\sqrt{2}$ is a solution of the quadratic equation, hence it should satisfy the equation. Therefore substituting $x=\sqrt{2}$ in the above equation gives us,

$$k\left(\sqrt{2}\right)^2+\sqrt{2}\left(\sqrt{2}\right)-4=0$$
$$2k+2-4=0$$
$$2k=2$$
$$k=1$$

Hence the value of $\boxed{k=1}$

(iv) We are given here that,

$x^2+3ax+k=0, x=-a$

Now, as we know that $x=-a$ is a solution of the quadratic equation, hence it should satisfy the equation. Therefore substituting $x=-a$ in the above equation gives us,

$$(-a)^2+3a(-a)+k=0$$
$$a^2-3a^2+k=0$$
$$k=2a^2$$

Hence the value of $\boxed{k=2a^2}$

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