(x) The given quadric equation is $kx^2+kx+1=-4x^2-x$, and roots are real and equal

Then find the value of *k*.

Here,

$$kx^2+kx+1=-4x^2-x$$
$$4x^2+kx^2+kx+x+1=0$$
$$(4+k)x^2+(k+1)x+1=0$$

So,

$a=(4+k), b=(k+1) \text{ and}, c=1$

As we know that $D=b^2-4ac$

Putting the value of $a=(4+k), b=(k-1) \text{ and}, c=1$

$=(k+1)^2-4\times(4+k)\times1$

$=(k^2+2k+1)-16-4k$

$=k^2-2k-15$

The given equation will have real and equal roots, if $D=0$

Thus,

$k^2-2k-15=0$

Now factorizing of the above equation

$$k^2-2k-15=0$$
$$k^2-5k+3k-15=0$$
$$k(k-5)+3(k-5)=0$$
$$(k-5)(k+3)=0$$

So, either

$(k-5)=0$ or $(k+3)=0$

$k=5$ $\quad k=-3$

Therefore, the value of $k=\boxed{5,-3}$

(xi) The given quadric equation is $(k+1)x^2+2(k+3)x+(k+8)=0$, and roots are real and equal

Then find the value of *k*.

Here,

$a=(k+1), b=2(k+3) \text{ and}, c=k+8$

As we know that $D=b^2-4ac$

Putting the value of $a=(k+1), b=2(k+3) \text{ and}, c=k+8$

$=(2(k+3))^2-4\times(k+1)\times(k+8)$

$=(4k^2+24k+36)-4(k^2+9k+8)$

$=4k^2+24k+36-4k^2-36k-32$

$=-12k+4$

The given equation will have real and equal roots, if $D=0$

$-12k+4=0$

$$k=\frac{4}{12}$$
$$=\frac{1}{3}$$

Therefore, the value of $k=\boxed{\frac{1}{3}}$

(xii) The given quadric equation is $x^2-2kx+7k-12=0$, and roots are real and equal

Then find the value of *k*.

Here,

$a=1, b=-2k \text{ and}, c=7k-12$

As we know that $D=b^2-4ac$

Putting the value of $a=1, b=-2k \text{ and}, c=7k-12$

$=(-2k)^2-4\times1\times(7k-12)$

$=4k^2-28k+48$

The given equation will have real and equal roots, if $D = 0$

$4k^2-28k+48=0$

$k^2-7k+12=0$

Now factorizing of the above equation

$k^2-4k-3k+12=0$

$k(k-4)-3(k-4)=0$

$(k-4)(k-3)=0$

So, either

$(k-4)=0$ or $(k-3)=0$

$k=4$ $\quad$ $k=3$

Therefore, the value of $k=\boxed{4,3}$

(xiii) The given quadric equation is $(k+1)x^2-2(3k+1)x+8k+1=0$, and roots are real and equal

Then find the value of *k*.

Here,

$a=k+1, b=-2(3k+1) \text{and}, c=8k+1$

As we know that $D=b^2-4ac$

Putting the value of $a=k+1, b=-2(3k+1) \text{and}, c=8k+1$

$=(-2(3k+1))^2-4\times(k+1)\times(8k+1)$

$=4(9k^2+6k+1)-4(8k^2+9k+1)$

$=36k^2+24k+4-32k^2-36k-4$

$=4k^2-12k$

The given equation will have real and equal roots, if $D = 0$

$4k^2-12k=0$

$k^2-3k=0$

Now factorizing of the above equation

$k(k-3)=0$

So, either

$k=0$ or $(k-3)=0$

$k=3$

Therefore, the value of $k=\boxed{0,3}$

*********** END **********