(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 $(k+3)=0$

$k=5$ $\qquad$ $k=-3$

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 $a = 1, b = -2k \text{ and}, c = 7k - 12$
$= (-2k)^2 - 4 \times 1 \times (7k - 12)$
$= 4k^2 - 28k + 48$
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 $(k-3) = 0$
$k = 4$ $k = 3$
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 **********