(iv) We have been given, $3x^2-2x+2=0$

Now we also know that for an equation $ax^2+bx+c=0$, the discriminant is given by the following equation:

$D=b^2-4ac$

Now, according to the equation given to us, we have, $a=3$, $b=-2$ and $c=2$.

Therefore, the discriminant is given as,

$$\begin{aligned} D &= (-2)^2-4(3)(2) \\ &= 4-24 \\ &= -20 \end{aligned}$$

Since, in order for a quadratic equation to have real roots, $D \geq 0$. Here we find that the equation does not satisfies this condition, hence it does not have real roots.

(v) We have been given, $2x^2-2\sqrt{6}x+3=0$

Now we also know that for an equation $ax^2+bx+c=0$, the discriminant is given by the following equation:

$D=b^2-4ac$

Now, according to the equation given to us, we have, $a=2$, $b=-2\sqrt{6}$ and $c=3$.

Therefore, the discriminant is given as,

$$\begin{aligned} D &= \left(-2\sqrt{6}\right)^2-4(2)(3) \\ &= 24-24 \\ &= 0 \end{aligned}$$

Since, in order for a quadratic equation to have real roots, $D \geq 0$. Here we find that the equation satisfies this condition, hence it has real and equal roots.

Now, the roots of an equation is given by the following equation,

$$x=\frac{-b\pm\sqrt{D}}{2a}$$

Therefore, the roots of the equation are given as follows,

$$\begin{aligned} x &= \frac{-\left(2\sqrt{6}\right)\pm 0}{2(2)} \\ &= \frac{-\sqrt{6}}{2} \\ &= -\sqrt{\frac{3}{2}} \end{aligned}$$

Therefore, the roots of the equation are real and equal and its value is $\boxed{-\sqrt{\frac{3}{2}}}$.

(vi) We have been given, $3a^2x^2+8abx+4b^2=0$

Now we also know that for an equation $ax^2+bx+c=0$, the discriminant is given by the following equation:

$D=b^2-4ac$

Now, according to the equation given to us, we have, $a=3a^2$, $b=8ab$ and $c=4b^2$.

Therefore, the discriminant is given as,

$$D = (8ab)^2 - 4(3a^2)(4b^2)$$
$$= 64a^2b^2 - 48a^2b^2$$
$$= 16a^2b^2$$

Since, in order for a quadratic equation to have real roots, $D \geq 0$. Here we find that the equation satisfies this condition, hence it has real roots.

Now, the roots of an equation is given by the following equation,

$$x = \frac{-b \pm \sqrt{D}}{2a}$$

Therefore, the roots of the equation are given as follows,

$$x = \frac{-(8ab) \pm \sqrt{16a^2b^2}}{2(3a^2)}$$
$$= \frac{-8ab \pm 4ab}{6a^2}$$
$$= \frac{-4b \pm 2b}{3a}$$

Now we solve both cases for the two values of x. So, we have,

$$x = \frac{-4b + 2b}{3a}$$
$$= -\frac{2b}{3a}$$

Also,

$$x = \frac{-4b - 2b}{3a}$$
$$= \frac{-2b}{a}$$

Therefore, the roots of the equation are $\boxed{-\frac{2b}{3a}}$ and $\boxed{-\frac{2b}{a}}$.

(vii) We have been given, $3x^2 + 2\sqrt{5}x - 5 = 0$

Now we also know that for an equation $ax^2 + bx + c = 0$, the discriminant is given by the following equation:

$$D = b^2 - 4ac$$

Now, according to the equation given to us, we have, $a = 3$, $b = 2\sqrt{5}$ and $c = -5$.

Therefore, the discriminant is given as,

$$D = (2\sqrt{5})^2 - 4(3)(-5)$$
$$= 20 + 60$$
$$= 80$$

Since, in order for a quadratic equation to have real roots, $D \geq 0$. Here we find that the equation satisfies this condition, hence it has real roots.

Now, the roots of an equation is given by the following equation,

$$x = \frac{-b \pm \sqrt{D}}{2a}$$

Therefore, the roots of the equation are given as follows,

$$x = \frac{-(2\sqrt{5}) \pm \sqrt{80}}{2(3)}$$
$$= \frac{-2\sqrt{5} \pm 4\sqrt{5}}{2(3)}$$
$$= \frac{-\sqrt{5} \pm 2\sqrt{5}}{3}$$

Now we solve both cases for the two values of *x*. So, we have,

$$x = \frac{-\sqrt{5} + 2\sqrt{5}}{3}$$
$$= \frac{\sqrt{5}}{3}$$

Also,

$$x = \frac{-\sqrt{5} - 2\sqrt{5}}{3}$$
$$= -\sqrt{5}$$

Therefore, the roots of the equation are $\boxed{\frac{\sqrt{5}}{3}}$ and $\boxed{-\sqrt{5}}$.

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