1. If the roots of the quadratic equation $ax^2+bx+c=0$ are in the ratio 3 : 2, find the relation between a, b, and c.
2. The quadratic equation $x^2-(k+6)x+9=0$ has equal roots. Find the value of k.
3. If one root of $x^2-3x+1=0$ is 2, find the other root.
4. Find the roots of the equation $2x^2-4x-6=0$ using the quadratic formula.
5. Given that one root of the quadratic equation $x^2+px+45=0$ is 5, find the value of p.
6. If the sum and product of the roots of the equation $x^2-x-1=0$ are equal, find the roots.
7. Find the condition under which the equation $ax^2+bx+c=0$ will have real and distinct roots.
8. The quadratic equation $3x^2-2ax+7a=0$ has one root that is twice the other. Determine a.
9. Solve for x in the equation $\sqrt{2}x^2-4x+\sqrt{8}=0$.
10. If the discriminant of $x^2+kx+16=0$ is 64, find k.
11. The equation $x^2-10cx+21c=0$ has roots of the form p and q. If $p-q=1$, find c.
12. Given the quadratic equation $x^2-(a+1)x+a=0$, for what value of a will one root be the square of the other?
13. Determine the range of values for m so that the equation $mx^2-2(m+1)x+m+7=0$ has real roots.