

Important Key points and results related to Algebra:

- ◆ $xy - 7 = 3$ is not a linear equation in two variables since the term xy is of degree 2.
- ◆ A linear equation in two variables represents a straight line in xy plane.
- ◆ If you obtain a false equation such as $0=1$, in any of the steps then the system has no solution.
- ◆ If you do not obtain a false solution, but obtain an identity, such as $0=0$ then the system has infinitely many solutions.
- ◆ If $f(x)$ and $g(x)$ are two polynomials of same degree then the polynomial carrying the highest coefficient will be the dividend. In case, if both have the same coefficient then compare the next least degree's coefficient and proceed with the division.
- ◆ Before proceeding to find the square root of a polynomial, one has to ensure that the degrees of the variables are in descending or ascending order.
- ◆ $ax^2 + bx + c = 0$ can equivalently be expressed as $x^2 + \frac{b}{a}x + \frac{c}{a} = 0$ since $a \neq 0$
- ◆ The formula for finding roots of a quadratic equation was known to Ancient Babylonians, though not in a form as we derived. They found the roots by creating the steps as a verse, which is a common practice at their times. Babylonians used quadratic equations for deciding to choose the dimensions of their land for agriculture.

Matrix

- ◆ When giving the order of a matrix, you should always mention the number of rows first, followed by the number of columns.
- ◆ If x and y are two real numbers such that $xy = 0$ then either $x = 0$ or $y = 0$. But this condition may not be true with respect to two matrices.
- ◆ $AB = 0$ does not necessarily imply that $A = 0$ or $B = 0$ or both $AB = 0$
- ◆ If A and B are any two non zero matrices, then $(A + B)^2 \neq A^2 + 2AB + B^2$
- ◆ However if $AB = BA$ then $(A + B)^2 = A^2 + 2AB + B^2$