Degenerate

In mathematics, something is called *degenerate* if it is a special case of an object which has, in some sense, "collapsed" into something simpler.

For example:

- A degenerate triangle has all three of its vertices lying on the same straight line, so the triangle is squashed completely flat. One type of degenerate triangle has one vertex lying between the other two; this triangle has zero area, its angles are $0°$, $0°$ and $180°$, and its side lengths satisfy $c = a + b$, where c is the longest side. Another type of degenerate triangle has two vertices at the same place. It is difficult to say what the angles of such a shape are.

- A degenerate conic is given by an equation $ax^2 + 2hxy + by^2 + 2fx + 2gy + c = 0$ where the solution set is just a point, a straight line or a pair of straight lines. For example, the equation $x^2 + y^2 = 0$ can be thought of as a degenerate circle, while $x^2 - y^2 = 0$ is a degenerate hyperbola: it gives the two straight lines $y = x$ and $y = -x$.

Last updated 17-Jul-16