Advanced amsmath Environments

Multiple alignment:

$$
\begin{aligned}
x &= y + z & a &= b + c \\
x^2 &= y^2 + 2yz + z^2 & a^2 &= b^2 + 2bc + c^2
\end{aligned}
$$

Equation gathering:

$$
\begin{gathered}
e^{i\theta} = \cos\theta + i\sin\theta \\
\cos^2\theta + \sin^2\theta = 1 \\
\tan\theta = \frac{\sin\theta}{\cos\theta}
\end{gathered}
$$

Multiline equation:

$$
\begin{aligned}
p(x) = 3x^6 + 14x^5 y + 590x^4 y^2 + 19x^3 y^3 \\
- 12x^2 y^4 - 12xy^5 + 2y^6 - a^3 b^3
\end{aligned}
$$