

Classical Invariant Theory(Peter J.Olver),Exercise 1.4

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Exercise (1.4). *Determine the possible canonical forms for a complex cubic polynomial $Q(p) = ap^3 + bp^2 + cp + d$ under affine changes of coordinates.*

Solve. • three distinct real roots: $p(x^3 - (q+1)x^2 + qx)$.

• one real root and two conjugate complex roots: $p[x^3 - (a + \bar{a})x^2 + a\bar{a}]$.

• triple roots: $x^3 = 0$.

□

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