C. Program code

Int[$(a_{-}+b_{-}*x_{+}c_{-}*x_{-}^{2})^{p_{-}}x_{symbol}$:=

Int1211[a,b,c,p,x] /; FreeQ[{a,b,c,p},x] Int1211[a_,b_,c_,p_,x_] := If[EqQ[p,0], $(a+b*x+c*x^2)^p*x$, If[EqQ[c,0], Int1111[a,b,1,p,x], If[EqQ[b,0], $Int[(a+c*x^2)^p,x],$ If $[EqQ[b^2-4*a*c,0]$, If[IntegerQ[p], Int[Cancel[$(b/2+c*x)^(2*p)/c^p],x],$ If [LtQ[p,-1], $2*(a+b*x+c*x^2)^(p+1)/((2*p+1)*(b+2*c*x))$, If [EqQ[p,-1/2], $(b/2+c*x)/Sqrt[a+b*x+c*x^2] * Int1111[b/2,c,1,-1,x],$ $(b+2*c*x)*(a+b*x+c*x^2)^p/(2*c*(2*p+1))]]],$ If[IntegerQ[p], If[EqQ[p,1], $a*x+b*x^2/2+c*x^3/3$, If[NeQ[a,0] && PerfectSquareQ[b^2-4*a*c], With $[\{q=Rt[b^2-4*a*c,2]\}, 1/c^p * Int[Simp[b/2-q/2+c*x,x]^p*Simp[b/2+q/2+c*x,x]^p,x]],$ If[GtQ[p,0], Int[ExpandIntegrand[(a+b*x+c*x^2)^p,x],x], If[LtQ[p,-1], $(b+2*c*x)*(a+b*x+c*x^2)^(p+1)/((p+1)*(b^2-4*a*c)) - 2*c*(2*p+3)/((p+1)*(b^2-4*a*c)) * Int1211[a,b,c,p+1,x],$ If[EqQ[a,0], Log[x]/b - Log[RemoveContent[b+c*x,x]]/b, If[PosQ[b^2-4*a*c] && PerfectSquareQ[b^2-4*a*c], With[$\{q=Rt[b^2-4*a*c,2]\}$, c/q * Int1111[Simplify[b/2-q/2],c,1,-1,x] - c/q * Int1111[Simplify[b/2+q/2],c,1,-1,x]], With[{q=1-4*Simplify[a*c/b^2]}, If [RationalQ[q] && (EqQ[q^2,1] || Not[RationalQ[b^2-4*a*c]]), $-2/b * Subst[Int[1/(q-x^2),x],x,1+2*c*x/b],$ -2 * Subst[Int[1/Simp[b^2-4*a*c-x^2,x],x],x,b+2*c*x]]]]]]]]], If[GtQ[p,0] && (IntegerQ[4*p] || IntegerQ[3*p]), $(b+2*c*x)*(a+b*x+c*x^2)^p/(2*c*(2*p+1)) - p*(b^2-4*a*c)/(2*c*(2*p+1)) * Int1211[a,b,c,p-1,x],$ If[LtQ[p,-1] && (IntegerQ[4*p] || IntegerQ[3*p]),

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If [EqQ[p,-3/2],
   -2*(b+2*c*x)/((b^2-4*a*c)*Sqrt[a+b*x+c*x^2]),
  (b+2*c*x)*(a+b*x+c*x^2)^{(p+1)}/((p+1)*(b^2-4*a*c)) - 2*c*(2*p+3)/((p+1)*(b^2-4*a*c)) * Int1211[a,b,c,p+1,x]],
If [GtQ[4*a-b^2/c,0],
  1/(2*c*(-4*c/(b^2-4*a*c))^p) * Subst[Int[Simp[1-x^2/(b^2-4*a*c),x]^p,x],x,b+2*c*x],
If [EqQ[p,-1/2],
 If[EqQ[a,0],
    2 * Subst[Int[1/(1-c*x^2),x],x,x/Sqrt[b*x+c*x^2]],
 2 * Subst[Int[1/(4*c-x^2),x],x,(b+2*c*x)/Sqrt[a+b*x+c*x^2]]],
If[EqQ[a,0] && (IntegerQ[4*p] || IntegerQ[3*p]),
  (b*x+c*x^2)^p/(-c*(b*x+c*x^2)/(b^2))^p * Int[(-c*x/b-c^2*x^2/b^2)^p,x],
If[IntegerQ[4*p],
  4*Sqrt[(b+2*c*x)^2]/(b+2*c*x) * Subst[Int[x^(4*(p+1)-1)/Sqrt[b^2-4*a*c+4*c*x^4],x],x,(a+b*x+c*x^2)^(1/4)],
If[IntegerQ[3*p],
  3*Sqrt[(b+2*c*x)^2]/(b+2*c*x) * Subst[Int[x^(3*(p+1)-1)/Sqrt[b^2-4*a*c+4*c*x^3],x],x,(a+b*x+c*x^2)^(1/3)],
With [\{q=Rt[b^2-4*a*c,2]\},
  -(a+b*x+c*x^2)^{(p+1)}/(q*(p+1)*((q-b-2*c*x)/(2*q))^{(p+1)}*Hypergeometric2F1[-p,p+1,p+2,(b+q+2*c*x)/(2*q)]]]]]]]]]]
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