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> restart;
> with(LinearAlgebra);
[&x, Add, Adjoint, BackwardSubstitute, BandMatrix, Basis, BezoutMatrix, BidiagonalForm,
  BilinearForm, CARE, CharacteristicMatrix, CharacteristicPolynomial, Column,
  ColumnDimension, ColumnOperation, ColumnSpace, CompanionMatrix,
  CompressedSparseForm, ConditionNumber, ConstantMatrix, ConstantVector, Copy,
  CreatePermutation, CrossProduct, DARE, DeleteColumn, DeleteRow, Determinant,
  Diagonal, DiagonalMatrix, Dimension, Dimensions, DotProduct, EigenConditionNumbers,
  Eigenvalues, Eigenvectors, Equal, ForwardSubstitute, FrobeniusForm,
  FromCompressedSparseForm, FromSplitForm, GaussianElimination, GenerateEquations,
  GenerateMatrix, Generic, GetResultDataType, GetResultShape, GivensRotationMatrix,
  GramSchmidt, HankelMatrix, HermiteForm, HermitianTranspose, HessenbergForm,
  HilbertMatrix, HouseholderMatrix, IdentityMatrix, IntersectionBasis, IsDefinite,
  IsOrthogonal, IsSimilar, IsUnitary, JordanBlockMatrix, JordanForm, KroneckerProduct,
  LA_Main, LUdecomposition, LeastSquares, LinearSolve, LyapunovSolve, Map, Map2,
  MatrixAdd, MatrixExponential, MatrixFunction, MatrixInverse, MatrixMatrixMultiply,
  MatrixNorm, MatrixPower, MatrixScalarMultiply, MatrixVectorMultiply,
  MinimalPolynomial, Minor, Modular, Multiply, NoUserValue, Norm, Normalize, NullSpace,
  OuterProductMatrix, Permanent, Pivot, PopovForm, ProjectionMatrix, QRdecomposition,
  RandomMatrix, RandomVector, Rank, RationalCanonicalForm, ReducedRowEchelonForm,
  Row, RowDimension, RowOperation, RowSpace, ScalarMatrix, ScalarMultiply,
  ScalarVector, SchurForm, SingularValues, SmithForm, SplitForm,
  StronglyConnectedBlocks, SubMatrix, SubVector, SumBasis, SylvesterMatrix, SylvesterSolve,
  ToeplitzMatrix, Trace, Transpose, TridiagonalForm, UnitVector, VandermondeMatrix,
  VectorAdd, VectorAngle, VectorMatrixMultiply, VectorNorm, VectorScalarMultiply,
  ZeroMatrix, ZeroVector, Zip]

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(1)

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> s := s; t2 := t2; t :=  $\frac{\alpha^2}{s} + t2$ ;

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      s := s
      t2 := t2
      t :=  $\frac{\alpha^2}{s} + t2$ 

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(2)

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> v := expand((s + 1) · (1 + s · t + s2 · t · (t - t2) + s3 · t2 · (t - t2)2));
v :=  $\alpha^4 s^2 t2 + \alpha^4 s t2 + \alpha^4 s + \alpha^2 s^2 t2 + \alpha^4 + \alpha^2 s t2 + \alpha^2 s + s^2 t2 + \alpha^2 + s t2 + s + 1$ 

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(3)

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> M := Matrix([[0, 1, 1, 0, 0, 0, 0, 0], [s, s - 1, 0, 1, 0, 0, 0, 0], [s · t, 0, s - 1, t2, 1, 0, 0, 0], [0,

```

$$\begin{aligned}
& s \cdot t, s \cdot t2, (t2 + 1) \cdot (s - 1), 0, 1, 0, 0], \left[0, 0, s \cdot (t - t2), 0, s - 1, t2, \frac{t}{t2}, 0 \right], \left[0, 0, 0, s \cdot (t - t2), s \cdot t2, (t2 + 1) \cdot (s - 1), 0, \frac{t}{t2} \right], \left[0, 0, 0, 0, s \cdot (t - t2), 0, \frac{(s - 1) \cdot t}{t2}, t + 1 - \frac{t}{t2} \right], \\
& \left[0, 0, 0, 0, 0, s \cdot (t - t2), s \cdot \left(t + 1 - \frac{t}{t2} \right), (s - 1) \cdot (t + 1) \right] \Bigg]; \\
M := & \left[\left[\begin{array}{cccccccc} 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \end{array} \right], \right. \tag{4}
\end{aligned}$$

$$\begin{aligned}
& \left[\begin{array}{cccccccc} s & s - 1 & 0 & 1 & 0 & 0 & 0 & 0 \end{array} \right], \\
& \left[\begin{array}{cccccccc} s \left(\frac{\alpha^2}{s} + t2 \right) & 0 & s - 1 & t2 & 1 & 0 & 0 & 0 \end{array} \right], \\
& \left[\begin{array}{cccccccc} 0 & s \left(\frac{\alpha^2}{s} + t2 \right) & s \cdot t2 & (t2 + 1) \cdot (s - 1) & 0 & 1 & 0 & 0 \end{array} \right], \\
& \left[\begin{array}{cccccccc} 0 & 0 & \alpha^2 & 0 & s - 1 & t2 & \frac{\frac{\alpha^2}{s} + t2}{t2} & 0 \end{array} \right], \\
& \left[\begin{array}{cccccccc} 0 & 0 & 0 & \alpha^2 & s \cdot t2 & (t2 + 1) \cdot (s - 1) & 0 & \frac{\frac{\alpha^2}{s} + t2}{t2} \end{array} \right], \\
& \left[\begin{array}{cccccccc} 0 & 0 & 0 & 0 & \alpha^2 & 0 & \frac{(s - 1) \left(\frac{\alpha^2}{s} + t2 \right)}{t2} & \frac{\alpha^2}{s} + t2 + 1 - \frac{\frac{\alpha^2}{s} + t2}{t2} \end{array} \right], \\
& \left[\begin{array}{cccccccc} 0 & 0 & 0 & 0 & 0 & \alpha^2 & s \left(\frac{\alpha^2}{s} + t2 + 1 - \frac{\frac{\alpha^2}{s} + t2}{t2} \right) & (s - 1) \left(\frac{\alpha^2}{s} + t2 + 1 \right) \end{array} \right] \Bigg]
\end{aligned}$$

$$\begin{aligned}
& \text{factor(CharacteristicPolynomial}(M, x)); \\
& \frac{1}{s^2 t2^2} \left((\alpha^2 + s t2 + s - x) (-x - 1 - t2 + s + \alpha) (x + 1 + t2 - s + \alpha) (-s t2 + \alpha - s \right. \tag{5} \\
& \quad \left. + x + 1) (s t2 + \alpha + s - x - 1) (\alpha^2 + s t2 + s x + s) (-s^2 t2 + s t2 x + \alpha^2 \right. \\
& \quad \left. + s t2) (\alpha^2 + s t2 - t2 x - t2) \right)
\end{aligned}$$

$$\begin{aligned}
& \text{Matrix}([[0, 1, 1, 0, 0, 0, 0, 0]]); \\
& k := \left[\begin{array}{cccccccc} 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \end{array} \right] \tag{6}
\end{aligned}$$

$$\begin{aligned} &> a1 := v; \\ a1 &:= \alpha^4 s^2 t^2 + \alpha^4 s t^2 + \alpha^4 s + \alpha^2 s^2 t^2 + \alpha^4 + \alpha^2 s t^2 + \alpha^2 s + s^2 t^2 + \alpha^2 + s t^2 + s \\ &\quad + 1 \end{aligned} \quad (7)$$

$$\begin{aligned} &> a2 := v \cdot k[1][1]; \\ &\quad \quad \quad a2 := 0 \end{aligned} \quad (8)$$

$$\begin{aligned} &> a3 := \text{expand}(v \cdot \text{Multiply}(k, M)[1][1]); \\ a3 &:= \alpha^6 s^2 t^2 + \alpha^4 s^3 t^2 + \alpha^6 s t^2 + \alpha^4 s^3 t^2 + \alpha^4 s^2 t^2 + \alpha^6 s + 3 \alpha^4 s^2 t^2 + \alpha^2 s^3 t^2 \\ &\quad + \alpha^6 + \alpha^4 s^2 + 2 \alpha^4 s t^2 + \alpha^2 s^3 t^2 + \alpha^2 s^2 t^2 + 2 \alpha^4 s + 3 \alpha^2 s^2 t^2 + s^3 t^2 + \alpha^4 \\ &\quad + \alpha^2 s^2 + 2 \alpha^2 s t^2 + s^3 t^2 + s^2 t^2 + 2 \alpha^2 s + 2 s^2 t^2 + \alpha^2 + s^2 + s t^2 + s \end{aligned} \quad (9)$$

$$\begin{aligned} &> a4 := \text{expand}(v \cdot \text{Multiply}(k, M^2)[1][1]); \\ a4 &:= \alpha^6 s^3 t^2 + \alpha^4 s^4 t^2 + \alpha^4 s^4 t^2 + \alpha^6 s^2 - \alpha^6 s t^2 + 2 \alpha^4 s^3 t^2 - \alpha^4 s^2 t^2 + \alpha^2 s^4 t^2 \\ &\quad + \alpha^4 s^3 - \alpha^4 s^2 t^2 + \alpha^2 s^4 t^2 - \alpha^6 + \alpha^4 s^2 - 2 \alpha^4 s t^2 + 2 \alpha^2 s^3 t^2 - \alpha^2 s^2 t^2 + s^4 t^2 \\ &\quad - \alpha^4 s + \alpha^2 s^3 - \alpha^2 s^2 t^2 + s^4 t^2 - \alpha^4 + \alpha^2 s^2 - 2 \alpha^2 s t^2 + s^3 t^2 - s^2 t^2 - \alpha^2 s + s^3 \\ &\quad - s^2 t^2 - \alpha^2 - s t^2 - s \end{aligned} \quad (10)$$

$$\begin{aligned} &> a5 := \text{expand}(v \cdot \text{Multiply}(k, M^3)[1][1]); \\ a5 &:= \alpha^6 s^3 t^3 + \alpha^4 s^4 t^4 + 2 \alpha^8 s^2 t^2 + \alpha^6 s^4 t^2 + 5 \alpha^6 s^3 t^2 + \alpha^6 s^2 t^3 + \alpha^4 s^5 t^2 \\ &\quad + 3 \alpha^4 s^4 t^3 + \alpha^4 s^3 t^4 + 2 \alpha^8 s t^2 + 2 \alpha^6 s^3 t^2 + 6 \alpha^6 s^2 t^2 + \alpha^4 s^5 t^2 + 2 \alpha^4 s^4 t^2 \\ &\quad + 5 \alpha^4 s^3 t^3 + \alpha^2 s^4 t^4 + 2 \alpha^8 s + \alpha^6 s^3 + 9 \alpha^6 s^2 t^2 + \alpha^6 s t^2 + 2 \alpha^4 s^4 t^2 \\ &\quad + 10 \alpha^4 s^3 t^2 + 2 \alpha^4 s^2 t^3 + \alpha^2 s^5 t^2 + 3 \alpha^2 s^4 t^3 + \alpha^2 s^3 t^4 + 2 \alpha^8 + 2 \alpha^6 s^2 \\ &\quad + 8 \alpha^6 s t^2 + \alpha^4 s^4 + 4 \alpha^4 s^3 t^2 + 10 \alpha^4 s^2 t^2 + \alpha^2 s^5 t^2 + 2 \alpha^2 s^4 t^2 + 5 \alpha^2 s^3 t^3 \\ &\quad + s^4 t^4 + 4 \alpha^6 s + \alpha^4 s^3 + 12 \alpha^4 s^2 t^2 + \alpha^4 s t^2 + 2 \alpha^2 s^4 t^2 + 10 \alpha^2 s^3 t^2 \\ &\quad + 2 \alpha^2 s^2 t^3 + s^5 t^2 + 3 s^4 t^3 + s^3 t^4 + 3 \alpha^6 + 2 \alpha^4 s^2 + 9 \alpha^4 s t^2 + \alpha^2 s^4 \\ &\quad + 4 \alpha^2 s^3 t^2 + 10 \alpha^2 s^2 t^2 + s^5 t^2 + 2 s^4 t^2 + 4 s^3 t^3 + 5 \alpha^4 s + \alpha^2 s^3 + 10 \alpha^2 s^2 t^2 \\ &\quad + \alpha^2 s t^2 + s^4 t^2 + 5 s^3 t^2 + s^2 t^3 + 3 \alpha^4 + 2 \alpha^2 s^2 + 7 \alpha^2 s t^2 + s^4 + 2 s^3 t^2 \\ &\quad + 4 s^2 t^2 + 3 \alpha^2 s + 3 s^2 t^2 + \alpha^2 + s t^2 + s \end{aligned} \quad (11)$$

$$\begin{aligned} &> a6 := \text{expand}(v \cdot \text{Multiply}(k, M^4)[1][1]); \\ a6 &:= \alpha^6 s^4 t^4 + \alpha^4 s^5 t^5 + 5 \alpha^6 s^4 t^3 + 5 \alpha^4 s^5 t^4 + 5 \alpha^8 s^3 t^2 + \alpha^6 s^5 t^2 + 14 \alpha^6 s^4 t^2 \\ &\quad + \alpha^6 s^3 t^3 - \alpha^6 s^2 t^4 + \alpha^4 s^6 t^2 + 9 \alpha^4 s^5 t^3 + 2 \alpha^4 s^4 t^4 - \alpha^4 s^3 t^5 + \alpha^2 s^5 t^5 \\ &\quad + 5 \alpha^6 s^4 t^2 + 5 \alpha^6 s^3 t^2 - 5 \alpha^6 s^2 t^3 + \alpha^4 s^6 t^2 + 5 \alpha^4 s^5 t^2 + 10 \alpha^4 s^4 t^3 \\ &\quad - 5 \alpha^4 s^3 t^4 + 5 \alpha^2 s^5 t^4 + 5 \alpha^8 s^2 - 5 \alpha^8 s t^2 + \alpha^6 s^4 + 19 \alpha^6 s^3 t^2 - 14 \alpha^6 s^2 t^2 \\ &\quad - \alpha^6 s t^3 + 2 \alpha^4 s^5 t^2 + 23 \alpha^4 s^4 t^2 - 8 \alpha^4 s^3 t^3 - 2 \alpha^4 s^2 t^4 + \alpha^2 s^6 t^2 \end{aligned} \quad (12)$$

$$\begin{aligned}
& + 9 \alpha^2 s^5 t^3 + 2 \alpha^2 s^4 t^4 - \alpha^2 s^3 t^5 + s^5 t^5 + 5 \alpha^6 s^3 - 5 \alpha^6 s^2 t - 5 \alpha^6 s t^2 \\
& + \alpha^4 s^5 + 10 \alpha^4 s^4 t - 10 \alpha^4 s^2 t^3 + \alpha^2 s^6 t^2 + 5 \alpha^2 s^5 t^2 + 10 \alpha^2 s^4 t^3 \\
& - 5 \alpha^2 s^3 t^4 + 5 s^5 t^4 - 5 \alpha^8 + 5 \alpha^6 s^2 - 20 \alpha^6 s t^2 + \alpha^4 s^4 + 19 \alpha^4 s^3 t \\
& - 24 \alpha^4 s^2 t^2 - \alpha^4 s t^3 + 2 \alpha^2 s^5 t + 23 \alpha^2 s^4 t^2 - 8 \alpha^2 s^3 t^3 - 2 \alpha^2 s^2 t^4 + s^6 t^2 \\
& + 9 s^5 t^3 + s^4 t^4 - s^3 t^5 - 5 \alpha^6 s + 5 \alpha^4 s^3 - 11 \alpha^4 s^2 t - 5 \alpha^4 s t^2 + \alpha^2 s^5 \\
& + 10 \alpha^2 s^4 t - 10 \alpha^2 s^2 t^3 + s^6 t + 5 s^5 t^2 + 5 s^4 t^3 - 5 s^3 t^4 - 6 \alpha^6 + 5 \alpha^4 s^2 \\
& - 21 \alpha^4 s t^2 + \alpha^2 s^4 + 14 \alpha^2 s^3 t - 24 \alpha^2 s^2 t^2 - \alpha^2 s t^3 + s^5 t + 9 s^4 t^2 - 9 s^3 t^3 \\
& - s^2 t^4 - 6 \alpha^4 s + 5 \alpha^2 s^3 - 11 \alpha^2 s^2 t - 5 \alpha^2 s t^2 + s^5 + 5 s^4 t - 5 s^3 t^2 \\
& - 5 s^2 t^3 - 6 \alpha^4 - 16 \alpha^2 s t - 10 s^2 t^2 - 6 \alpha^2 s - 6 s^2 t - \alpha^2 - s t - s
\end{aligned}$$

> $a7 := \text{expand}(v \cdot \text{Multiply}(k, M^5)[1][1]);$

$$\begin{aligned}
a7 := & \alpha^6 s^6 t^2 + \alpha^6 s^2 t^5 + \alpha^4 s^7 t^2 + \alpha^4 s^3 t^6 + 9 \alpha^6 s^5 t^2 + \alpha^4 s^7 t^2 + 9 \alpha^4 s^6 t^2 & (13) \\
& + 32 \alpha^6 s^4 t^2 + \alpha^6 s t^4 + 2 \alpha^4 s^6 t^2 + 42 \alpha^4 s^5 t^2 + \alpha^2 s^7 t^2 + 19 \alpha^2 s^6 t^3 \\
& + 18 \alpha^4 s^5 t^2 + \alpha^2 s^7 t^2 + 9 \alpha^2 s^6 t^2 + 27 \alpha^4 s^4 t^2 + \alpha^4 s t^4 + 2 \alpha^2 s^6 t^2 \\
& + 42 \alpha^2 s^5 t^2 + 18 \alpha^2 s^5 t^2 + 18 \alpha^2 s^4 t^2 - 19 \alpha^2 s^3 t^2 + 10 \alpha^2 s^2 t^2 + \alpha^2 s t^4 \\
& + 6 \alpha^2 s t^3 + \alpha^{12} + 38 \alpha^2 t^3 s^2 - 6 s^4 t^4 + s + \alpha^2 + \alpha^2 s^6 + s^7 t^2 + \alpha^2 s^5 + s^6 t^2 \\
& + 9 \alpha^2 s^4 + 9 s^5 t^2 + 10 \alpha^4 s - 5 \alpha^2 s^3 - 5 s^4 t^2 - 5 \alpha^2 s^2 - 5 s^3 t^2 + 9 \alpha^8 s^3 + \alpha^6 s^5 \\
& + 9 \alpha^6 s^4 + \alpha^4 s^6 + 4 \alpha^6 s^3 + \alpha^4 s^5 + s^7 t^2 + 9 \alpha^4 s^4 + 4 \alpha^4 s^3 - 5 \alpha^4 s^2 + 10 \alpha^2 s \\
& + 7 \alpha^{10} s + 6 s^2 t^4 + s^6 t^6 + 6 s^6 t^5 + 7 \alpha^8 s + 15 s^6 t^4 + 19 s^6 t^3 + 9 s^6 t^2 \\
& + 6 s^5 t^3 + 14 s^5 t^2 - 14 s^4 t^3 + s^2 t^5 - 14 s^4 t^2 + s^5 t^4 + s^3 t^6 - 5 \alpha^6 s^2 \\
& + 6 s^3 t^5 + 15 \alpha^6 s + 14 s^3 t^4 + 7 \alpha^{10} + 16 \alpha^6 + 10 \alpha^4 + 16 \alpha^8 + \alpha^2 s^6 t^6 \\
& + 6 \alpha^{10} s^2 t^2 + 9 \alpha^8 s^4 t^2 + 21 \alpha^8 s^3 t^2 + 9 \alpha^8 s^2 t^3 + 28 \alpha^6 s^5 t^2 + 17 \alpha^6 s^4 t^3 \\
& + 8 \alpha^6 s^3 t^4 + 19 \alpha^4 s^6 t^3 + 7 \alpha^4 s^5 t^4 - \alpha^4 s^4 t^5 + 6 \alpha^2 s^6 t^5 + 6 \alpha^{10} s t^2 \\
& + 30 \alpha^8 s^2 t^2 + 6 \alpha^6 s^4 t^2 + 28 \alpha^6 s^3 t^3 + 21 \alpha^4 s^5 t^3 + 3 \alpha^4 s^4 t^4 + 15 \alpha^2 s^6 t^4 \\
& + \alpha^2 s^5 t^5 + 6 \alpha^6 s^2 t^4 + 2 \alpha^4 s^2 t^5 + \alpha^2 s^3 t^6 + 6 \alpha^6 s t^3 + 12 \alpha^4 s^2 t^4 \\
& + \alpha^6 s^5 t^5 + \alpha^4 s^6 t^6 + 6 \alpha^6 s^5 t^4 + 6 \alpha^4 s^6 t^5 + 9 \alpha^8 s^3 t^3 + 15 \alpha^6 s^5 t^3 \\
& + 9 \alpha^6 s^4 t^4 + 15 \alpha^4 s^6 t^4 + \alpha^4 s^5 t^5 + 36 \alpha^8 s t^2 - 14 \alpha^6 s^3 t^2 + 69 \alpha^6 s^2 t^2 \\
& - 8 \alpha^4 s^4 t^2 + 42 \alpha^4 s^3 t^3 + 21 \alpha^2 s^5 t^3 + 3 \alpha^2 s^4 t^4 + 2 \alpha^2 s^2 t^5 + 6 \alpha^4 s t^3 \\
& + 12 \alpha^2 s^2 t^4 + 6 \alpha^2 s^3 t^5 + 27 \alpha^6 s^2 t^2 + 24 \alpha^6 s t^2 + 23 \alpha^4 s^3 t^2 + 47 \alpha^4 s^2 t^3 \\
& + 3 \alpha^2 s^4 t^3 + 22 \alpha^2 s^3 t^4 + 65 \alpha^6 s t^2 - 19 \alpha^4 s^3 t^2 + 89 \alpha^4 s^2 t^2 - 8 \alpha^2 s^4 t^2 \\
& + 33 \alpha^2 s^3 t^3 + 31 \alpha^4 s^2 t^2 + 24 \alpha^4 s t^2 + 2 \alpha^2 s^3 t^2 + 60 \alpha^4 s t^2 + 59 \alpha^2 s^2 t^2
\end{aligned}$$

$$\begin{aligned}
& + 15 \alpha^2 s t^2 + 30 \alpha^2 s t^2 + 6 \alpha^4 s^3 t^5 + 27 \alpha^8 s^2 t^2 + 9 \alpha^8 s t^2 + 23 \alpha^6 s^3 t^2 \\
& + 32 \alpha^6 s^2 t^3 + 3 \alpha^4 s^4 t^3 + 22 \alpha^4 s^3 t^4 + 7 \alpha^2 s^5 t^4 - \alpha^2 s^4 t^5 - s^4 t^5 + 15 s^2 t^3 \\
& + 20 s^2 t^2 + 10 t^2 s^2 + 14 s^3 t^3 + s t^2 + \alpha^{12} s + \frac{\alpha^{12}}{s t^2} + \frac{\alpha^{10}}{t^2} + \frac{\alpha^{10}}{s t^2} + \frac{\alpha^8}{t^2} \\
& + \frac{\alpha^{12}}{t^2} + \frac{\alpha^8}{t^2 s} + s^6
\end{aligned}$$

> a8 := expand(v · Multiply(k, M^6)[1][1]);

$$\begin{aligned}
a8 := & -14 \alpha^8 s^2 t^4 + 14 \alpha^6 s^6 t^2 - 7 \alpha^6 s^2 t^5 + 14 \alpha^4 s^7 t^2 - 7 \alpha^4 s^3 t^6 - 14 \alpha^8 s t^3 & (14) \\
& + 48 \alpha^6 s^5 t^2 + 2 \alpha^4 s^7 t^2 + 68 \alpha^4 s^6 t^2 + \alpha^2 s^8 t^2 + 34 \alpha^2 s^7 t^3 - 14 \alpha^6 s^4 t^2 \\
& - 7 \alpha^6 s t^4 + 28 \alpha^4 s^6 t^2 - 14 \alpha^4 s^5 t^2 + \alpha^2 s^8 t^2 + 14 \alpha^2 s^7 t^2 + 42 \alpha^2 s^6 t^3 \\
& + 34 \alpha^4 s^5 t^2 + 2 \alpha^2 s^7 t^2 + 68 \alpha^2 s^6 t^2 - 14 \alpha^4 s^4 t^2 - 7 \alpha^4 s t^4 + 28 \alpha^2 s^6 t^2 \\
& - 14 \alpha^2 s^5 t^2 + 20 \alpha^2 s^5 t^2 - 21 \alpha^2 s^4 t^2 + 28 \alpha^2 s^3 t^2 - 8 \alpha^2 s^2 t^2 - 7 \alpha^2 s t^4 \\
& - 21 \alpha^2 s t^3 - 7 \alpha^{12} - 126 \alpha^2 t^3 s^2 + 20 s^4 t^4 - s - \alpha^2 + s^8 t^2 + \alpha^2 s^6 + s^7 t^2 \\
& + 14 \alpha^2 s^5 + 14 s^6 t^2 - 14 \alpha^2 s^4 - 14 s^5 t^2 - 22 \alpha^4 s + 14 \alpha^2 s^2 + 14 s^3 t^2 + 14 \alpha^8 s^4 \\
& + 7 \alpha^8 s^3 + 14 \alpha^6 s^5 + \alpha^4 s^6 + s^8 t^2 + 7 \alpha^6 s^3 + 14 \alpha^4 s^5 + 14 s^7 t^2 + 7 \alpha^4 s^3 \\
& + 14 \alpha^4 s^2 - 15 \alpha^2 s + s^7 t^7 + 7 s^7 t^6 + 34 \alpha^{10} s^2 + 21 s^7 t^5 + 35 s^7 t^4 + 34 s^7 t^3 \\
& - s^3 t^7 - 21 s^2 t^4 + 34 \alpha^8 s^2 - 7 \alpha^8 s + s^6 t^4 + 7 s^6 t^3 + 20 s^6 t^2 - 20 s^5 t^3 \\
& - s^2 t^6 - 28 s^5 t^2 + 28 s^4 t^3 - 7 s^2 t^5 + 14 s^4 t^2 + s^4 t^6 - 7 s^5 t^4 - 7 s^3 t^6 \\
& + 41 \alpha^6 s^2 - 20 s^3 t^5 - 21 \alpha^6 s - 28 s^3 t^4 - 34 \alpha^{10} - 42 \alpha^6 - 15 \alpha^4 - 48 \alpha^8 \\
& + \alpha^2 s^6 t^6 + 7 \alpha^8 s^4 t^2 + 63 \alpha^8 s^3 t^2 - 63 \alpha^8 s^2 t^3 + 14 \alpha^6 s^5 t^2 + 119 \alpha^6 s^4 t^3 \\
& - 56 \alpha^6 s^3 t^4 + 42 \alpha^4 s^6 t^3 + 56 \alpha^4 s^5 t^4 + 7 \alpha^4 s^4 t^5 + 35 \alpha^2 s^7 t^4 + 7 \alpha^2 s^6 t^5 \\
& - 27 \alpha^{10} s t^2 + 125 \alpha^8 s^3 t^2 - 98 \alpha^8 s^2 t^2 + 155 \alpha^6 s^4 t^2 - 43 \alpha^6 s^3 t^3 + 58 \alpha^4 s^5 t^3 \\
& + 47 \alpha^4 s^4 t^4 + 22 \alpha^2 s^6 t^4 + 13 \alpha^2 s^5 t^5 - 48 \alpha^6 s^2 t^4 - \alpha^2 s^3 t^7 - 14 \alpha^4 s^2 t^5 \\
& - 7 \alpha^2 s^3 t^6 - 35 \alpha^6 s t^3 - 69 \alpha^4 s^2 t^4 + 14 \alpha^6 s^5 t^5 + \alpha^4 s^6 t^6 + \alpha^2 s^7 t^7 \\
& + 63 \alpha^8 s^4 t^3 + 35 \alpha^6 s^6 t^3 + 63 \alpha^6 s^5 t^4 + 35 \alpha^4 s^7 t^4 + 7 \alpha^4 s^6 t^5 + 7 \alpha^2 s^7 t^6 \\
& + 27 \alpha^{10} s^3 t^2 + 14 \alpha^8 s^5 t^2 + 98 \alpha^8 s^4 t^2 + 14 \alpha^8 s^3 t^3 + 48 \alpha^6 s^6 t^2 + 78 \alpha^6 s^5 t^3 \\
& + 27 \alpha^6 s^4 t^4 - 13 \alpha^6 s^3 t^5 + 34 \alpha^4 s^7 t^3 + 22 \alpha^4 s^6 t^4 + 13 \alpha^4 s^5 t^5 + \alpha^4 s^4 t^6 \\
& + 21 \alpha^2 s^7 t^5 - 139 \alpha^8 s t^2 + 139 \alpha^6 s^3 t^2 - 203 \alpha^6 s^2 t^2 + 169 \alpha^4 s^4 t^2 \\
& - 57 \alpha^4 s^3 t^3 + 58 \alpha^2 s^5 t^3 + 33 \alpha^2 s^4 t^4 - 14 \alpha^2 s^2 t^5 - 35 \alpha^4 s t^3 - 55 \alpha^2 s^2 t^4 \\
& - 33 \alpha^2 s^3 t^5 - 98 \alpha^6 s t^2 + 98 \alpha^4 s^3 t^2 - 189 \alpha^4 s^2 t^3 + 84 \alpha^2 s^4 t^3 - 84 \alpha^2 s^3 t^4
\end{aligned}$$

$$\begin{aligned}
& -188 \alpha^6 s t^2 + 126 \alpha^4 s^3 t^2 - 238 \alpha^4 s^2 t^2 + 71 \alpha^2 s^4 t^2 - 71 \alpha^2 s^3 t^3 - 15 \alpha^4 s^2 t^2 \\
& - 98 \alpha^4 s t^2 + 35 \alpha^2 s^3 t^2 - 162 \alpha^4 s t^2 - 140 \alpha^2 s^2 t^2 + 14 s^3 t^2 - 35 \alpha^2 s t^2 \\
& - 50 \alpha^2 s t^2 - 33 \alpha^4 s^3 t^5 + \alpha^2 s^4 t^6 - 7 \alpha^8 s^2 t^2 - 63 \alpha^8 s t^2 + 84 \alpha^6 s^3 t^2 \\
& - 154 \alpha^6 s^2 t^3 + 147 \alpha^4 s^4 t^3 - 84 \alpha^4 s^3 t^4 + 56 \alpha^2 s^5 t^4 + 7 \alpha^2 s^4 t^5 - s^5 t^5 \\
& + 7 s^4 t^5 - 35 s^2 t^3 - 35 s^2 t^2 - 15 t^2 s^2 - 14 s^3 t^3 - s t^2 - \frac{\alpha^{12}}{s^2 t^2} + \frac{\alpha^{10}}{t^2} \\
& + \frac{7 s \alpha^8}{t^2} + s^6 \alpha^6 - s t^5 \alpha^6 - 2 s^2 t^6 \alpha^4 + s^7 \alpha^4 - \frac{\alpha^{14}}{s^2 t^2} + \frac{\alpha^{12}}{t^2} + \frac{8 s \alpha^{10}}{t^2} \\
& - s t^5 \alpha^4 - 2 s^2 t^6 \alpha^2 + s^7 \alpha^2 - \alpha^4 s^3 t^7 + \frac{s \alpha^{14}}{t^2} + s^7 t^2 \alpha^6 - s^2 t^6 \alpha^6 + s^8 t^2 \alpha^4 \\
& + \frac{\alpha^{14}}{t^2} - \frac{\alpha^{14}}{s t^2} + \frac{8 s \alpha^{12}}{t^2} - \frac{\alpha^{10}}{s^2 t^2} - \alpha^2 s t^5 + 7 \alpha^{12} s^2 - \frac{8 \alpha^{12}}{s t^2} - \frac{8 \alpha^{10}}{s t^2} \\
& + \alpha^6 s^6 t^6 + \alpha^4 s^7 t^7 + 7 \alpha^6 s^6 t^5 + 7 \alpha^4 s^7 t^6 + 14 \alpha^8 s^4 t^4 + 21 \alpha^6 s^6 t^4 \\
& + 21 \alpha^4 s^7 t^5 + \alpha^4 s^8 t^2 - \frac{7 \alpha^8}{t^2 s} + s^7
\end{aligned}$$

> $A := \text{Matrix}([[a1], [a2], [a3], [a4], [a5], [a6], [a7], [a8]]);$

$$A := \left[\left[\alpha^4 s^2 t^2 + \alpha^4 s t^2 + \alpha^4 s + \alpha^2 s^2 t^2 + \alpha^4 + \alpha^2 s t^2 + \alpha^2 s + s^2 t^2 + \alpha^2 + s t^2 + s + 1 \right], \right.$$

$$\left[0 \right],$$

$$\left[\alpha^6 s^2 t^2 + \alpha^4 s^3 t^2 + \alpha^6 s t^2 + \alpha^4 s^3 t^2 + \alpha^4 s^2 t^2 + \alpha^6 s + 3 \alpha^4 s^2 t^2 + \alpha^2 s^3 t^2 + \alpha^6 + \alpha^4 s^2 + 2 \alpha^4 s t^2 + \alpha^2 s^3 t^2 + \alpha^2 s^2 t^2 + 2 \alpha^4 s + 3 \alpha^2 s^2 t^2 + s^3 t^2 + \alpha^4 + \alpha^2 s^2 + 2 \alpha^2 s t^2 + s^3 t^2 + s^2 t^2 + 2 \alpha^2 s + 2 s^2 t^2 + \alpha^2 + s^2 + s t^2 + s \right],$$

$$\left[\alpha^6 s^3 t^2 + \alpha^4 s^4 t^2 + \alpha^4 s^4 t^2 + \alpha^6 s^2 - \alpha^6 s t^2 + 2 \alpha^4 s^3 t^2 - \alpha^4 s^2 t^2 + \alpha^2 s^4 t^2 + \alpha^4 s^3 - \alpha^4 s^2 t^2 + \alpha^2 s^4 t^2 - \alpha^6 + \alpha^4 s^2 - 2 \alpha^4 s t^2 + 2 \alpha^2 s^3 t^2 - \alpha^2 s^2 t^2 + s^4 t^2 - \alpha^4 s + \alpha^2 s^3 - \alpha^2 s^2 t^2 + s^4 t^2 - \alpha^4 + \alpha^2 s^2 - 2 \alpha^2 s t^2 + s^3 t^2 - s^2 t^2 - \alpha^2 s + s^3 - s^2 t^2 - \alpha^2 - s t^2 - s \right],$$

$$\left[\alpha^6 s^3 t^3 + \alpha^4 s^4 t^4 + 2 \alpha^8 s^2 t^2 + \alpha^6 s^4 t^2 + 5 \alpha^6 s^3 t^2 + \alpha^6 s^2 t^3 + \alpha^4 s^5 t^2 + 3 \alpha^4 s^4 t^3 + \alpha^4 s^3 t^4 + 2 \alpha^8 s t^2 + 2 \alpha^6 s^3 t^2 + 6 \alpha^6 s^2 t^2 + \alpha^4 s^5 t^2 + 2 \alpha^4 s^4 t^2 + 5 \alpha^4 s^3 t^3 + \alpha^2 s^4 t^4 + 2 \alpha^8 s + \alpha^6 s^3 + 9 \alpha^6 s^2 t^2 + \alpha^6 s t^2 + 2 \alpha^4 s^4 t^2 + 10 \alpha^4 s^3 t^2 + 2 \alpha^4 s^2 t^3 + \alpha^2 s^5 t^2 + 3 \alpha^2 s^4 t^3 + \alpha^2 s^3 t^4 + 2 \alpha^8 + 2 \alpha^6 s^2 \right]$$

$$\begin{aligned}
& + 8 \alpha^6 s t 2 + \alpha^4 s^4 + 4 \alpha^4 s^3 t 2 + 10 \alpha^4 s^2 t 2^2 + \alpha^2 s^5 t 2 + 2 \alpha^2 s^4 t 2^2 + 5 \alpha^2 s^3 t 2^3 \\
& + s^4 t 2^4 + 4 \alpha^6 s + \alpha^4 s^3 + 12 \alpha^4 s^2 t 2 + \alpha^4 s t 2^2 + 2 \alpha^2 s^4 t 2 + 10 \alpha^2 s^3 t 2^2 \\
& + 2 \alpha^2 s^2 t 2^3 + s^5 t 2^2 + 3 s^4 t 2^3 + s^3 t 2^4 + 3 \alpha^6 + 2 \alpha^4 s^2 + 9 \alpha^4 s t 2 + \alpha^2 s^4 \\
& + 4 \alpha^2 s^3 t 2 + 10 \alpha^2 s^2 t 2^2 + s^5 t 2 + 2 s^4 t 2^2 + 4 s^3 t 2^3 + 5 \alpha^4 s + \alpha^2 s^3 + 10 \alpha^2 s^2 t 2 \\
& + \alpha^2 s t 2^2 + s^4 t 2 + 5 s^3 t 2^2 + s^2 t 2^3 + 3 \alpha^4 + 2 \alpha^2 s^2 + 7 \alpha^2 s t 2 + s^4 + 2 s^3 t 2 \\
& + 4 s^2 t 2^2 + 3 \alpha^2 s + 3 s^2 t 2 + \alpha^2 + s t 2 + s],
\end{aligned}$$

$$\begin{aligned}
& [\alpha^6 s^4 t 2^4 + \alpha^4 s^5 t 2^5 + 5 \alpha^6 s^4 t 2^3 + 5 \alpha^4 s^5 t 2^4 + 5 \alpha^8 s^3 t 2 + \alpha^6 s^5 t 2 + 14 \alpha^6 s^4 t 2^2 \\
& + \alpha^6 s^3 t 2^3 - \alpha^6 s^2 t 2^4 + \alpha^4 s^6 t 2^2 + 9 \alpha^4 s^5 t 2^3 + 2 \alpha^4 s^4 t 2^4 - \alpha^4 s^3 t 2^5 + \alpha^2 s^5 t 2^5 \\
& + 5 \alpha^6 s^4 t 2 + 5 \alpha^6 s^3 t 2^2 - 5 \alpha^6 s^2 t 2^3 + \alpha^4 s^6 t 2 + 5 \alpha^4 s^5 t 2^2 + 10 \alpha^4 s^4 t 2^3 \\
& - 5 \alpha^4 s^3 t 2^4 + 5 \alpha^2 s^5 t 2^4 + 5 \alpha^8 s^2 - 5 \alpha^8 s t 2 + \alpha^6 s^4 + 19 \alpha^6 s^3 t 2 - 14 \alpha^6 s^2 t 2^2 \\
& - \alpha^6 s t 2^3 + 2 \alpha^4 s^5 t 2 + 23 \alpha^4 s^4 t 2^2 - 8 \alpha^4 s^3 t 2^3 - 2 \alpha^4 s^2 t 2^4 + \alpha^2 s^6 t 2^2 \\
& + 9 \alpha^2 s^5 t 2^3 + 2 \alpha^2 s^4 t 2^4 - \alpha^2 s^3 t 2^5 + s^5 t 2^5 + 5 \alpha^6 s^3 - 5 \alpha^6 s^2 t 2 - 5 \alpha^6 s t 2^2 \\
& + \alpha^4 s^5 + 10 \alpha^4 s^4 t 2 - 10 \alpha^4 s^2 t 2^3 + \alpha^2 s^6 t 2 + 5 \alpha^2 s^5 t 2^2 + 10 \alpha^2 s^4 t 2^3 \\
& - 5 \alpha^2 s^3 t 2^4 + 5 s^5 t 2^4 - 5 \alpha^8 + 5 \alpha^6 s^2 - 20 \alpha^6 s t 2 + \alpha^4 s^4 + 19 \alpha^4 s^3 t 2 \\
& - 24 \alpha^4 s^2 t 2^2 - \alpha^4 s t 2^3 + 2 \alpha^2 s^5 t 2 + 23 \alpha^2 s^4 t 2^2 - 8 \alpha^2 s^3 t 2^3 - 2 \alpha^2 s^2 t 2^4 + s^6 t 2^2 \\
& + 9 s^5 t 2^3 + s^4 t 2^4 - s^3 t 2^5 - 5 \alpha^6 s + 5 \alpha^4 s^3 - 11 \alpha^4 s^2 t 2 - 5 \alpha^4 s t 2^2 + \alpha^2 s^5 \\
& + 10 \alpha^2 s^4 t 2 - 10 \alpha^2 s^2 t 2^3 + s^6 t 2 + 5 s^5 t 2^2 + 5 s^4 t 2^3 - 5 s^3 t 2^4 - 6 \alpha^6 + 5 \alpha^4 s^2 \\
& - 21 \alpha^4 s t 2 + \alpha^2 s^4 + 14 \alpha^2 s^3 t 2 - 24 \alpha^2 s^2 t 2^2 - \alpha^2 s t 2^3 + s^5 t 2 + 9 s^4 t 2^2 - 9 s^3 t 2^3 \\
& - s^2 t 2^4 - 6 \alpha^4 s + 5 \alpha^2 s^3 - 11 \alpha^2 s^2 t 2 - 5 \alpha^2 s t 2^2 + s^5 + 5 s^4 t 2 - 5 s^3 t 2^2 \\
& - 5 s^2 t 2^3 - 6 \alpha^4 - 16 \alpha^2 s t 2 - 10 s^2 t 2^2 - 6 \alpha^2 s - 6 s^2 t 2 - \alpha^2 - s t 2 - s],
\end{aligned}$$

$$\begin{aligned}
& [\alpha^6 s^6 t 2 + \alpha^6 s^2 t 2^5 + \alpha^4 s^7 t 2^2 + \alpha^4 s^3 t 2^6 + 9 \alpha^6 s^5 t 2 + \alpha^4 s^7 t 2 + 9 \alpha^4 s^6 t 2^2 \\
& + 32 \alpha^6 s^4 t 2 + \alpha^6 s t 2^4 + 2 \alpha^4 s^6 t 2 + 42 \alpha^4 s^5 t 2^2 + \alpha^2 s^7 t 2^2 + 19 \alpha^2 s^6 t 2^3 \\
& + 18 \alpha^4 s^5 t 2 + \alpha^2 s^7 t 2 + 9 \alpha^2 s^6 t 2^2 + 27 \alpha^4 s^4 t 2 + \alpha^4 s t 2^4 + 2 \alpha^2 s^6 t 2 \\
& + 42 \alpha^2 s^5 t 2^2 + 18 \alpha^2 s^5 t 2 + 18 \alpha^2 s^4 t 2 - 19 \alpha^2 s^3 t 2 + 10 \alpha^2 s^2 t 2 + \alpha^2 s t 2^4 \\
& + 6 \alpha^2 s t 2^3 + \alpha^{12} + 38 \alpha^2 t 2^3 s^2 - 6 s^4 t 2^4 + s + \alpha^2 + \alpha^2 s^6 + s^7 t 2 + \alpha^2 s^5 + s^6 t 2
\end{aligned}$$

$$\begin{aligned}
& + 9 \alpha^2 s^4 + 9 s^5 t^2 + 10 \alpha^4 s - 5 \alpha^2 s^3 - 5 s^4 t^2 - 5 \alpha^2 s^2 - 5 s^3 t^2 + 9 \alpha^8 s^3 + \alpha^6 s^5 \\
& + 9 \alpha^6 s^4 + \alpha^4 s^6 + 4 \alpha^6 s^3 + \alpha^4 s^5 + s^7 t^2 + 9 \alpha^4 s^4 + 4 \alpha^4 s^3 - 5 \alpha^4 s^2 + 10 \alpha^2 s \\
& + 7 \alpha^{10} s + 6 s^2 t^4 + s^6 t^6 + 6 s^6 t^5 + 7 \alpha^8 s + 15 s^6 t^4 + 19 s^6 t^3 + 9 s^6 t^2 \\
& + 6 s^5 t^3 + 14 s^5 t^2 - 14 s^4 t^3 + s^2 t^5 - 14 s^4 t^2 + s^5 t^4 + s^3 t^6 - 5 \alpha^6 s^2 \\
& + 6 s^3 t^5 + 15 \alpha^6 s + 14 s^3 t^4 + 7 \alpha^{10} + 16 \alpha^6 + 10 \alpha^4 + 16 \alpha^8 + \alpha^2 s^6 t^6 \\
& + 6 \alpha^{10} s^2 t^2 + 9 \alpha^8 s^4 t^2 + 21 \alpha^8 s^3 t^2 + 9 \alpha^8 s^2 t^3 + 28 \alpha^6 s^5 t^2 + 17 \alpha^6 s^4 t^3 \\
& + 8 \alpha^6 s^3 t^4 + 19 \alpha^4 s^6 t^3 + 7 \alpha^4 s^5 t^4 - \alpha^4 s^4 t^5 + 6 \alpha^2 s^6 t^5 + 6 \alpha^{10} s t^2 \\
& + 30 \alpha^8 s^2 t^2 + 6 \alpha^6 s^4 t^2 + 28 \alpha^6 s^3 t^3 + 21 \alpha^4 s^5 t^3 + 3 \alpha^4 s^4 t^4 + 15 \alpha^2 s^6 t^4 \\
& + \alpha^2 s^5 t^5 + 6 \alpha^6 s^2 t^4 + 2 \alpha^4 s^2 t^5 + \alpha^2 s^3 t^6 + 6 \alpha^6 s t^3 + 12 \alpha^4 s^2 t^4 \\
& + \alpha^6 s^5 t^5 + \alpha^4 s^6 t^6 + 6 \alpha^6 s^5 t^4 + 6 \alpha^4 s^6 t^5 + 9 \alpha^8 s^3 t^3 + 15 \alpha^6 s^5 t^3 \\
& + 9 \alpha^6 s^4 t^4 + 15 \alpha^4 s^6 t^4 + \alpha^4 s^5 t^5 + 36 \alpha^8 s t^2 - 14 \alpha^6 s^3 t^2 + 69 \alpha^6 s^2 t^2 \\
& - 8 \alpha^4 s^4 t^2 + 42 \alpha^4 s^3 t^3 + 21 \alpha^2 s^5 t^3 + 3 \alpha^2 s^4 t^4 + 2 \alpha^2 s^2 t^5 + 6 \alpha^4 s t^3 \\
& + 12 \alpha^2 s^2 t^4 + 6 \alpha^2 s^3 t^5 + 27 \alpha^6 s^2 t^2 + 24 \alpha^6 s t^2 + 23 \alpha^4 s^3 t^2 + 47 \alpha^4 s^2 t^3 \\
& + 3 \alpha^2 s^4 t^3 + 22 \alpha^2 s^3 t^4 + 65 \alpha^6 s t^2 - 19 \alpha^4 s^3 t^2 + 89 \alpha^4 s^2 t^2 - 8 \alpha^2 s^4 t^2 \\
& + 33 \alpha^2 s^3 t^3 + 31 \alpha^4 s^2 t^2 + 24 \alpha^4 s t^2 + 2 \alpha^2 s^3 t^2 + 60 \alpha^4 s t^2 + 59 \alpha^2 s^2 t^2 \\
& + 15 \alpha^2 s t^2 + 30 \alpha^2 s t^2 + 6 \alpha^4 s^3 t^5 + 27 \alpha^8 s^2 t^2 + 9 \alpha^8 s t^2 + 23 \alpha^6 s^3 t^2 \\
& + 32 \alpha^6 s^2 t^3 + 3 \alpha^4 s^4 t^3 + 22 \alpha^4 s^3 t^4 + 7 \alpha^2 s^5 t^4 - \alpha^2 s^4 t^5 - s^4 t^5 + 15 s^2 t^3
\end{aligned}$$

$$\begin{aligned}
& + 20 s^2 t^2 + 10 t^2 s^2 + 14 s^3 t^3 + s t^2 + \alpha^{12} s + \frac{\alpha^{12}}{s t^2} + \frac{\alpha^{10}}{t^2} + \frac{\alpha^{10}}{s t^2} + \frac{\alpha^8}{t^2} \\
& + \left. \frac{\alpha^{12}}{t^2} + \frac{\alpha^8}{t^2 s} + s^6 \right], \\
& \left[-14 \alpha^8 s^2 t^4 + 14 \alpha^6 s^6 t^2 - 7 \alpha^6 s^2 t^5 + 14 \alpha^4 s^7 t^2 - 7 \alpha^4 s^3 t^6 - 14 \alpha^8 s t^3 \right. \\
& + 48 \alpha^6 s^5 t^2 + 2 \alpha^4 s^7 t^2 + 68 \alpha^4 s^6 t^2 + \alpha^2 s^8 t^2 + 34 \alpha^2 s^7 t^3 - 14 \alpha^6 s^4 t^2 \\
& - 7 \alpha^6 s t^4 + 28 \alpha^4 s^6 t^2 - 14 \alpha^4 s^5 t^2 + \alpha^2 s^8 t^2 + 14 \alpha^2 s^7 t^2 + 42 \alpha^2 s^6 t^3 \\
& + 34 \alpha^4 s^5 t^2 + 2 \alpha^2 s^7 t^2 + 68 \alpha^2 s^6 t^2 - 14 \alpha^4 s^4 t^2 - 7 \alpha^4 s t^4 + 28 \alpha^2 s^6 t^2 \\
& - 14 \alpha^2 s^5 t^2 + 20 \alpha^2 s^5 t^2 - 21 \alpha^2 s^4 t^2 + 28 \alpha^2 s^3 t^2 - 8 \alpha^2 s^2 t^2 - 7 \alpha^2 s t^4 \\
& - 21 \alpha^2 s t^3 - 7 \alpha^{12} - 126 \alpha^2 t^3 s^2 + 20 s^4 t^4 - s - \alpha^2 + s^8 t^2 + \alpha^2 s^6 + s^7 t^2 \\
& + 14 \alpha^2 s^5 + 14 s^6 t^2 - 14 \alpha^2 s^4 - 14 s^5 t^2 - 22 \alpha^4 s + 14 \alpha^2 s^2 + 14 s^3 t^2 + 14 \alpha^8 s^4 \\
& + 7 \alpha^8 s^3 + 14 \alpha^6 s^5 + \alpha^4 s^6 + s^8 t^2 + 7 \alpha^6 s^3 + 14 \alpha^4 s^5 + 14 s^7 t^2 + 7 \alpha^4 s^3 \\
& + 14 \alpha^4 s^2 - 15 \alpha^2 s + s^7 t^7 + 7 s^7 t^6 + 34 \alpha^{10} s^2 + 21 s^7 t^5 + 35 s^7 t^4 + 34 s^7 t^3 \\
& - s^3 t^7 - 21 s^2 t^4 + 34 \alpha^8 s^2 - 7 \alpha^8 s + s^6 t^4 + 7 s^6 t^3 + 20 s^6 t^2 - 20 s^5 t^3 \\
& - s^2 t^6 - 28 s^5 t^2 + 28 s^4 t^3 - 7 s^2 t^5 + 14 s^4 t^2 + s^4 t^6 - 7 s^5 t^4 - 7 s^3 t^6 \\
& + 41 \alpha^6 s^2 - 20 s^3 t^5 - 21 \alpha^6 s - 28 s^3 t^4 - 34 \alpha^{10} - 42 \alpha^6 - 15 \alpha^4 - 48 \alpha^8 \\
& + \alpha^2 s^6 t^6 + 7 \alpha^8 s^4 t^2 + 63 \alpha^8 s^3 t^2 - 63 \alpha^8 s^2 t^3 + 14 \alpha^6 s^5 t^2 + 119 \alpha^6 s^4 t^3 \\
& \left. - 56 \alpha^6 s^3 t^4 + 42 \alpha^4 s^6 t^3 + 56 \alpha^4 s^5 t^4 + 7 \alpha^4 s^4 t^5 + 35 \alpha^2 s^7 t^4 + 7 \alpha^2 s^6 t^5 \right]
\end{aligned}$$

$$\begin{aligned}
& - 27 \alpha^{10} s t^2 + 125 \alpha^8 s^3 t^2 - 98 \alpha^8 s^2 t^2 + 155 \alpha^6 s^4 t^2 - 43 \alpha^6 s^3 t^3 + 58 \alpha^4 s^5 t^3 \\
& + 47 \alpha^4 s^4 t^4 + 22 \alpha^2 s^6 t^4 + 13 \alpha^2 s^5 t^5 - 48 \alpha^6 s^2 t^4 - \alpha^2 s^3 t^7 - 14 \alpha^4 s^2 t^5 \\
& - 7 \alpha^2 s^3 t^6 - 35 \alpha^6 s t^3 - 69 \alpha^4 s^2 t^4 + 14 \alpha^6 s^5 t^5 + \alpha^4 s^6 t^6 + \alpha^2 s^7 t^7 \\
& + 63 \alpha^8 s^4 t^3 + 35 \alpha^6 s^6 t^3 + 63 \alpha^6 s^5 t^4 + 35 \alpha^4 s^7 t^4 + 7 \alpha^4 s^6 t^5 + 7 \alpha^2 s^7 t^6 \\
& + 27 \alpha^{10} s^3 t^2 + 14 \alpha^8 s^5 t^2 + 98 \alpha^8 s^4 t^2 + 14 \alpha^8 s^3 t^3 + 48 \alpha^6 s^6 t^2 + 78 \alpha^6 s^5 t^3 \\
& + 27 \alpha^6 s^4 t^4 - 13 \alpha^6 s^3 t^5 + 34 \alpha^4 s^7 t^3 + 22 \alpha^4 s^6 t^4 + 13 \alpha^4 s^5 t^5 + \alpha^4 s^4 t^6 \\
& + 21 \alpha^2 s^7 t^5 - 139 \alpha^8 s t^2 + 139 \alpha^6 s^3 t^2 - 203 \alpha^6 s^2 t^2 + 169 \alpha^4 s^4 t^2 \\
& - 57 \alpha^4 s^3 t^3 + 58 \alpha^2 s^5 t^3 + 33 \alpha^2 s^4 t^4 - 14 \alpha^2 s^2 t^5 - 35 \alpha^4 s t^3 - 55 \alpha^2 s^2 t^4 \\
& - 33 \alpha^2 s^3 t^5 - 98 \alpha^6 s t^2 + 98 \alpha^4 s^3 t^2 - 189 \alpha^4 s^2 t^3 + 84 \alpha^2 s^4 t^3 - 84 \alpha^2 s^3 t^4 \\
& - 188 \alpha^6 s t^2 + 126 \alpha^4 s^3 t^2 - 238 \alpha^4 s^2 t^2 + 71 \alpha^2 s^4 t^2 - 71 \alpha^2 s^3 t^3 - 15 \alpha^4 s^2 t^2 \\
& - 98 \alpha^4 s t^2 + 35 \alpha^2 s^3 t^2 - 162 \alpha^4 s t^2 - 140 \alpha^2 s^2 t^2 + 14 s^3 t^2 - 35 \alpha^2 s t^2 \\
& - 50 \alpha^2 s t^2 - 33 \alpha^4 s^3 t^5 + \alpha^2 s^4 t^6 - 7 \alpha^8 s^2 t^2 - 63 \alpha^8 s t^2 + 84 \alpha^6 s^3 t^2 \\
& - 154 \alpha^6 s^2 t^3 + 147 \alpha^4 s^4 t^3 - 84 \alpha^4 s^3 t^4 + 56 \alpha^2 s^5 t^4 + 7 \alpha^2 s^4 t^5 - s^5 t^5 \\
& + 7 s^4 t^5 - 35 s^2 t^3 - 35 s^2 t^2 - 15 t^2 s^2 - 14 s^3 t^3 - s t^2 - \frac{\alpha^{12}}{s^2 t^2} + \frac{\alpha^{10}}{t^2} \\
& + \frac{7 s \alpha^8}{t^2} + s^6 \alpha^6 - s t^5 \alpha^6 - 2 s^2 t^6 \alpha^4 + s^7 \alpha^4 - \frac{\alpha^{14}}{s^2 t^2} + \frac{\alpha^{12}}{t^2} + \frac{8 s \alpha^{10}}{t^2} \\
& - s t^5 \alpha^4 - 2 s^2 t^6 \alpha^2 + s^7 \alpha^2 - \alpha^4 s^3 t^7 + \frac{s \alpha^{14}}{t^2} + s^7 t^2 \alpha^6 - s^2 t^6 \alpha^6 + s^8 t^2 \alpha^4
\end{aligned}$$

$$\begin{aligned}
& + \frac{\alpha^{14}}{t^2} - \frac{\alpha^{14}}{s \cdot t^2} + \frac{8 s \alpha^{12}}{t^2} - \frac{\alpha^{10}}{s^2 t^2} - \alpha^2 s t^2^5 + 7 \alpha^{12} s^2 - \frac{8 \alpha^{12}}{s t^2} - \frac{8 \alpha^{10}}{s t^2} \\
& + \alpha^6 s^6 t^2^6 + \alpha^4 s^7 t^2^7 + 7 \alpha^6 s^6 t^2^5 + 7 \alpha^4 s^7 t^2^6 + 14 \alpha^8 s^4 t^2^4 + 21 \alpha^6 s^6 t^2^4 \\
& + 21 \alpha^4 s^7 t^2^5 + \alpha^4 s^8 t^2^2 - \frac{7 \alpha^8}{t^2 s} + s^7 \Big]
\end{aligned}$$

$$\begin{aligned}
> V := \text{Transpose} \left(\text{VandermondeMatrix} \left(\left[\left[\alpha^2 + s \cdot t^2 + s, s + \alpha - t^2 - 1, s - \alpha - t^2 - 1, s \cdot t^2 \right. \right. \right. \right. \\
\left. \left. \left. + s - \alpha - 1, s \cdot t^2 + s + \alpha - 1, -\frac{(\alpha^2 + s \cdot t^2 + s)}{s}, \frac{(\alpha^2 + s \cdot t^2 - t^2)}{t^2}, \right. \right. \right. \\
\left. \left. \left. \frac{(s^2 \cdot t^2 - s \cdot t^2 - \alpha^2)}{s \cdot t^2} \right] \right] \right);
\end{aligned}$$

$$V := \left[\left[\left[1, 1, 1, 1, 1, 1, 1, 1 \right] \right] \right]$$

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$$\left[\alpha^2 + s t^2 + s, s + \alpha - t^2 - 1, s - \alpha - t^2 - 1, s t^2 - \alpha + s - 1, s t^2 + \alpha + s - 1, \right. \\
\left. -\frac{\alpha^2 + s t^2 + s}{s}, \frac{\alpha^2 + s t^2 - t^2}{t^2}, \frac{s^2 t^2 - \alpha^2 - s t^2}{s t^2} \right]$$

$$\left[(\alpha^2 + s t^2 + s)^2, (s + \alpha - t^2 - 1)^2, (s - \alpha - t^2 - 1)^2, (s t^2 - \alpha + s - 1)^2, \right.$$

$$\left. (s t^2 + \alpha + s - 1)^2, \frac{(\alpha^2 + s t^2 + s)^2}{s^2}, \frac{(\alpha^2 + s t^2 - t^2)^2}{t^2}, \frac{(s^2 t^2 - \alpha^2 - s t^2)^2}{s^2 t^2} \right]$$

$$\left[(\alpha^2 + s t^2 + s)^3, (s + \alpha - t^2 - 1)^3, (s - \alpha - t^2 - 1)^3, (s t^2 - \alpha + s - 1)^3, \right.$$

$$\left. (s t^2 + \alpha + s - 1)^3, -\frac{(\alpha^2 + s t^2 + s)^3}{s^3}, \frac{(\alpha^2 + s t^2 - t^2)^3}{t^2^3}, \frac{(s^2 t^2 - \alpha^2 - s t^2)^3}{s^3 t^2^3} \right]$$

$$\left[(\alpha^2 + s t^2 + s)^4, (s + \alpha - t^2 - 1)^4, (s - \alpha - t^2 - 1)^4, (s t^2 - \alpha + s - 1)^4, \right.$$

$$\left. (s t^2 + \alpha + s - 1)^4, \frac{(\alpha^2 + s t^2 + s)^4}{s^4}, \frac{(\alpha^2 + s t^2 - t^2)^4}{t^2^4}, \frac{(s^2 t^2 - \alpha^2 - s t^2)^4}{s^4 t^2^4} \right]$$

$$\left[(\alpha^2 + s t^2 + s)^5, (s + \alpha - t^2 - 1)^5, (s - \alpha - t^2 - 1)^5, (s t^2 - \alpha + s - 1)^5, \right.$$

$$\begin{aligned}
& \left[(s t2 + \alpha + s - 1)^5, -\frac{(\alpha^2 + s t2 + s)^5}{s^5}, \frac{(\alpha^2 + s t2 - t2)^5}{t2^5}, \frac{(s^2 t2 - \alpha^2 - s t2)^5}{s^5 t2^5} \right], \\
& \left[(\alpha^2 + s t2 + s)^6, (s + \alpha - t2 - 1)^6, (s - \alpha - t2 - 1)^6, (s t2 - \alpha + s - 1)^6, \right. \\
& \left. (s t2 + \alpha + s - 1)^6, \frac{(\alpha^2 + s t2 + s)^6}{s^6}, \frac{(\alpha^2 + s t2 - t2)^6}{t2^6}, \frac{(s^2 t2 - \alpha^2 - s t2)^6}{s^6 t2^6} \right], \\
& \left[(\alpha^2 + s t2 + s)^7, (s + \alpha - t2 - 1)^7, (s - \alpha - t2 - 1)^7, (s t2 - \alpha + s - 1)^7, \right. \\
& \left. (s t2 + \alpha + s - 1)^7, -\frac{(\alpha^2 + s t2 + s)^7}{s^7}, \frac{(\alpha^2 + s t2 - t2)^7}{t2^7}, \frac{(s^2 t2 - \alpha^2 - s t2)^7}{s^7 t2^7} \right] \Big]
\end{aligned}$$

> simplify(Multiply(V^{-1} , A));

$$\begin{aligned}
& \frac{1}{2} \frac{(\alpha^2 + \alpha + 1) (\alpha^2 - \alpha + 1) (s t2 + 1) (\alpha^2 + s t2) \alpha^2 s}{(\alpha^2 + \alpha s + s^2) (\alpha^2 - \alpha t2 + t2^2)} \\
& \frac{1}{2} \frac{(\alpha^2 + \alpha + 1) (\alpha^2 - \alpha + 1) (s t2 + 1) (\alpha^2 + s t2) \alpha^2 s}{(\alpha^2 - \alpha s + s^2) (\alpha^2 + \alpha t2 + t2^2)} \\
& \frac{(\alpha^2 - \alpha + 1) (s t2 + 1) (\alpha^2 + s t2) \alpha^2}{2 s^2 t2^2 - 2 \alpha s t2 + 2 \alpha^2} \\
& \frac{(\alpha^2 + \alpha + 1) (s t2 + 1) (\alpha^2 + s t2) \alpha^2}{2 s^2 t2^2 + 2 \alpha s t2 + 2 \alpha^2} \\
& \frac{(\alpha^2 + \alpha + 1) (\alpha^2 - \alpha + 1) (s t2 + 1) s^6}{(\alpha^4 + \alpha^2 s^2 + s^4) (s + t2)} \\
& \frac{t2^5 s (\alpha^2 + \alpha + 1) (\alpha^2 - \alpha + 1) (s t2 + 1)}{(\alpha^2 + \alpha t2 + t2^2) (\alpha^2 - \alpha t2 + t2^2) (s + t2)} \\
& \frac{(\alpha^4 + \alpha^2 + 1) s^5 t2^5}{s^4 t2^4 + \alpha^2 s^2 t2^2 + \alpha^4}
\end{aligned}$$

(17)