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Matlab 4

Problem 1:

eigvalProd =

 -0.0431 + 0.0000i

eigPoly =

 1.0000 -3.6765 1.2131 -0.4712 -1.5105 0.4632 -0.0431

eidDet =

 -0.0431

Problem 2:

P =

 -0.6325 0.2626 0.0170 -0.7342

 -0.3162 -0.1313 0.7800 -0.4127

 0.3162 -0.9191 0.5257 -0.5198

 -0.6325 0.2626 -0.3391 -0.1429

D =

 5.0000   0   0   0

   0 1.0000   0   0

   0   0 -2.0000   0

   0   0   0 -2.0000

PDP =

 1.6653e-15

The value is extremely small, so accounting for rounding error the answer is correct.

Problem 3:

P =

 -0.8642 0.7549 -0.0000 -0.9632

 0.2357 -0.3397 0.6396 -0.2431

-0.3143   0.4152 -0.6396   0.1138

-0.3143   0.3774 -0.4264   0.0134

D =

  5.0000   0   0   0

     0   4.0000   0   0

     0   0   2.0000   0

     0   0   0   4.0000

The basis consists of the vectors in matrix P.

Problem 4:

P =

  -0.4082   0

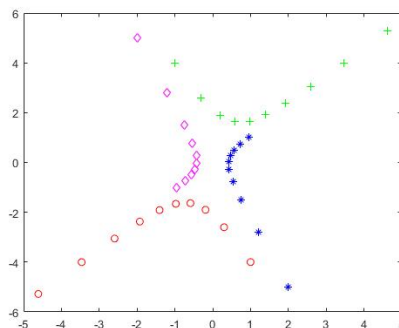 -0.8165 -0.4082

C =

  -0.6000 -0.8000

   0.8000 -0.6000

Problem 5:

The origin of the dynamical system looks like a saddle point. On eigenvalue is greater than 1, and the other is less than 1, so the eigenvalues support this.

eig =

   1.3275   0

      0   0.5725

Problem 6:

The origin of the dynamical system looks like either an attractor or a repeller. The absolute values of the eigenvalues are less than 1, so the system is an attractor.

D =

  0.9000 + 0.2000i   0.0000 + 0.0000i

  0.0000 + 0.0000i 0.9000 - 0.2000i

eigval1 =

  0.9220

eigval2 =

  0.9220