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**Matlab 5**

**Problem 1:**

P =

-0.5268 -0.0364 0.6877 0.2012 0.4558

0.4696 -0.6903 0.1045 -0.2883 0.4572

-0.1396 0.4783 -0.1655 -0.7245 0.4465

-0.4670 -0.2976 -0.6958 0.2768 0.3640

0.5141 0.4526 -0.0679 0.5242 0.5014

If basis (P) is orthogonal, P' \* P == I

basisP =

4.0704e-16

The resulting value is small enough with rounding error that basis P is orthogonal.

**Problem 2:**

V =

-10 3 6 0

2 3 0 5

-6 -3 6 0

16 0 6 0

2 3 0 -5

**Problem 3:**

checkRank =

2

x =

1.0000 0 9.2802 -57.3951 0

0 1.0000 -8.4403 59.4996 0

0 0 0 0 1.0000

0 0 0 0 0

The system is inconsistent.

x0 =

-0.3659

-0.2708

0.4824

1.6264

x0 is a least solution of Ax = b but x0 is not a unique solution.

error =

-0.1126

0.2198

0.0740

-0.1506

perpindicular =

1.0e-15 \*

-0.0833 -0.0798 -0.1110 0.0278

The resulting vector is small enough with rounding error so that it is essentially 0. The error vector is perpendicular to the column space of A.

err1 =

0.2986

err2 =

2.0693

err3 =

1.6319

err4 =

0.5300

The error values are all larger than the error.

**Problem 4:**

QRminA =

2.2204e-16

QtQInv =

3.3307e-16

The resulting maximum value in each result matrix is close enough to 0 with rounding error.

**Problem 5:**

B =

1.4509

0.8111

The orbit is an ellipse because e < 1.

r =

1.3300

**Problem 6:**

B =

-0.8558

4.7025

5.5554

-0.0274

y(t) = -.8558 + 4.7025t + 5.5554t^2 - .0274t^3

v(t) = dy/dt

v(t)= 4.7025 + 11.1108t - .0822t^2

velocity =

53.0365