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**Problem Set 2**

1. >> v=zeros(10,1);

>> v(1,1) = 0;

v(2,1) = 1;

v(3,1) = v(1,1) + v(2,1);

v(4,1) = v(2,1) + v(3,1);

v(5,1) = v(3,1) + v(4,1);

v(6,1) = v(4,1) + v(5,1);

v(7,1) = v(5,1) + v(6,1);

v(8,1) = v(6,1) + v(7,1);

v(9,1) = v(7,1) + v(8,1);

v(10,1) = v(8,1) + v(9,1);

v =

0

1

1

2

3

5

8

13

21

34

1. >> a=[3 2 4 5 1];

>> b=[8 3 2 4 7];

>> c(1)=b(a(1));

>> c(2)=b(a(2));

>> c(3)=b(a(3));

>> c(4)=b(a(4));

>> c(5)=b(a(5));

>> c

c = 2 3 4 7 8

1. a. True

b. False. If the vector a had any repeating numbers, there could be multiple 1s in the same column.

c. False. The matrix dimensions don’t allow the command P\b and it produces an error. To fix this, the code should be corrected to b/P, and the correct statement is c=b/P.

d. True

1. a. >> a=[1 2 3; 2 1 1; -1 0 3];

>> b=[6; -3; 1];

>> a\*b=

>> a\*b

ans =

3

10

-3

b. >> a=[3 1 -1; 1 7 -2; -1 3 0];

>> b=[1 2 3; 2 1 1; -1 0 3];

>> a\*b

ans =

6 7 7

17 9 4

5 1 0

c. >> a=[3 1 -1; 1 7 -2; -1 3 0];

>> b=[3; 10; -3];

>> a\*b

ans =

22

79

27

d. >> a=[6 7 7; 17 9 4; 5 1 0];

>> b=[6; -3; 1];

>> a\*b

ans =

22

79

27

1. >> a=[1 2; 3 4; 5 6];

>> b=[7; 8; 9];

>> x=(a'\*a)\(a'\*b)

**x =**

**-6.0000**

**6.5000**

>> v=(a\*x)-b;

>> R=sqrt(dot(v,v))

**R =**

**2.3364e-14**

1. >> a=[3 1 3; 1 2 2; 1 1 1; 2 1 5];

>> b=[7; 5; 3; 4]

>> x=(a'\*a)\(a'\*b)

**x =**

**2.0794**

**1.7302**

**-0.3651**

>> v=(a\*x)-b;

>> dot(v,v)

**ans =**

**0.2540**

>> x=[1; 1; 1];

>> v=(a\*x)-b;

dot(v,v)

**ans =**

**16**

>> x=[1; 2; 0];

>> v=(a\*x)-b;

dot(v,v)

**ans =**

**4**

1. >> x=10;

y=sqrt((65^2)-(x^2))

**y =**

**64.2262**

>> a=[-39; 52];

>> b=[25; 60];

>> **c=[10; -64.2262];**

>> L1=b-a

L1 =

64

8

>> L2=b-c

L2 =

15.0000

124.2262

>> L3=a-c

L3 =

-49.0000

116.2262

>> **L1=sqrt(dot(L1,L1))**

**L1 =**

**64.4981**

**>> L2=sqrt(dot(L2,L2))**

**L2 =**

**125.1285**

**>> L3=sqrt(dot(L3,L3))**

**L3 =**

**126.1330**

>> s=(L1 + L2 + L3)/2; A = sqrt(s\*(s-L1)\*(s-L2)\*(s-L3))

**A =**

**3.9152e+03**

>> R=65; **A=(L1\*L2\*L3)/(4\*R)**

**A =**

**3.9152e+03**