

Engineering maths assignment 3

a)

[illegible]

b)

$$A := \begin{pmatrix} 2 & 2 & -4 & 2 & 6 & -2 \\ 4 & -2 & 2 & 4 & 2 & -6 \\ 2 & 6 & -6 & -2 & 4 & 2 \\ 10 & 4 & -2 & -2 & 4 & 2 \\ -6 & -2 & 4 & 6 & 2 & 6 \\ 8 & 6 & 2 & -12 & -6 & -4 \end{pmatrix}$$

$$B := \begin{pmatrix} 12 \\ 60 \\ -45 \\ -9 \\ 48 \\ -81 \end{pmatrix}$$

$$\mathbf{A} \cdot \mathbf{T} := \mathbf{B}$$

$$\mathbf{Tbar} := \mathbf{A}^{-1} \cdot \mathbf{B}$$

$$\mathbf{Tbar} = \begin{pmatrix} 1.5 \\ -3 \\ 4.5 \\ 6 \\ 3 \\ -1.5 \end{pmatrix}$$

C)

	A	B	C	D	E	F	G	H	I	J	K	L
12	inverse matrix											
13	-0.1514	0.0775	0.0423	0.0986	-0.0528	-0.0493		12				
14	-0.2746	0.2723	0.4061	-0.108	0.1174	0.054		60				
15	0.1655	-0.0188	-0.1315	-0.0012	0.1643	0.1256		-45				
16	-0.4577	0.3427	0.3991	-0.0411	0.0012	-0.1045		-9				
17	0.5458	-0.2676	-0.3732	0.0458	0.0915	0.1021		48				
18	-0.0775	-0.0728	-0.0094	0.0892	0.0117	-0.0446		-81				
19												
20												
21	-0.1514	0.0775	0.0423	0.0986	-0.0528	-0.0493		12				
22	0	0.1318	0.3295	-0.2868	0.2132	0.1434		38.233				
23	0	0.0659	-0.0853	0.1066	0.1066	0.0717		-31.884				
24	0	0.1085	0.2713	-0.3391	0.1609	0.0446		-45.279				
25	0	0.0116	-0.2209	0.4012	-0.0988	-0.0756		91.256				
26	0	-0.1124	-0.031	0.0388	0.0388	-0.0194		-87.14				
27						t1		756				
28												
29		0.1318	0.3295	-0.2868	0.2132	0.1434		38.233				
30		0	-0.25	0.25	0	0		-51				
31		0	0	-0.1029	-0.0147	-0.0735		-76.765				
32		0	-0.25	0.4265	-0.1176	-0.0882		87.882				
33		0	0.25	-0.2059	0.2206	0.1029		-54.529				
34						t2		384				
35												
36			-0.25	0.25	0	0		-51				
37			0	-0.1029	-0.0147	-0.0735		-76.765				
38			0	0.1765	-0.1176	-0.0882		138.88				
39			0	0.0441	0.2206	0.1029		-105.53				
40						t3		702				
41												
42				-0.1029	-0.0147	-0.0735		-76.765				
43				0	-0.1429	-0.2143		7.2857				
44				0	0.2143	0.0714		-138.43				
45						t4		498				
46												
47					-0.1429	-0.2143		7.2857		t5	-816	
48					0	-0.25		-127.5				
49						t6		510				

d)

$$A := \begin{pmatrix} 2 & 2 & -4 & 2 & 6 & -2 \\ 4 & -2 & 2 & 4 & 2 & -6 \\ 2 & 6 & -6 & -2 & 4 & 2 \\ 10 & 4 & -2 & -2 & 4 & 2 \\ -6 & -2 & 4 & 6 & 2 & 6 \\ 8 & 6 & 2 & -12 & -6 & -4 \end{pmatrix}$$

$$B := \begin{pmatrix} 12 \\ 60 \\ -45 \\ -9 \\ 48 \\ -81 \end{pmatrix}$$

$$A^{-1} = \begin{pmatrix} -0.151 & 0.077 & 0.042 & 0.099 & -0.053 & -0.049 \\ -0.275 & 0.272 & 0.406 & -0.108 & 0.117 & 0.054 \\ 0.165 & -0.019 & -0.131 & -1.174 \times 10^{-3} & 0.164 & 0.126 \\ -0.458 & 0.343 & 0.399 & -0.041 & 1.174 \times 10^{-3} & -0.104 \\ 0.546 & -0.268 & -0.373 & 0.046 & 0.092 & 0.102 \\ -0.077 & -0.073 & -9.39 \times 10^{-3} & 0.089 & 0.012 & -0.045 \end{pmatrix}$$

$$A^{-1} \cdot T := B$$

$$Tbar := (A^{-1})^{-1} \cdot B$$

$$Tbar = \begin{pmatrix} 756 \\ 384 \\ 702 \\ 498 \\ -816 \\ 510 \end{pmatrix}$$