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1: ClrHome
2: "CHANGES MADE TO ALLOW PROGRAM TO RUN
3: "  EVEN IN EXTREME CASE OF MISSING BASIC
4: "  LISTS L1, L2, ...
5: SetUpEditor
6: Fix 3
7: Disp "THREE SPACE"
8: {0,0,0}→LZ
9: {1,1,1}→LONE
10: If dim(L1)=0
11: LONE→L1
12: If dim(L1)≠3
13: LONE→L1
14: If dim(L2)=0
15: LONE→L2
16: If dim(L2)≠3
17: LONE→L2
18: LZ→L3
19: LZ→L4
20: Lbl 5
21: Menu("MENU 1", "ENTER L1", 10, "ENTER L2", 15, "L1+L2 TO D", 20,
    "L1XL2 TO L4", 25, "SWAP L1,L2", 30, "DISPLAY", 35, "GO TO MENU 2",
    40)
22: Lbl 10
23: Disp "ENTER AS A LIST"
24: Input "L1= ", L1
25: If sum(L1*L1)=0
26: Then
27: Disp "CANNOT DEAL WITH", "ZERO VECTOR"
28: Goto 10
29: End
30: Goto 5
31: Lbl 15
32: Disp "ENTER AS A LIST"
33: Input "L2= ", L2
34: If sum(L2*L2)=0
35: Then
36: Disp "CANNOT DEAL WITH", "ZERO VECTOR"
37: Goto 15
38: End
39: Goto 5
40: Lbl 20
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41: L1*L2→L3
42: Disp "DOT PRODUCT="
43: sum(L3)→D
44: Pause D
45: Goto 5
46: Lbl 25
47: L1(2)*L2(3)-L1(3)*L2(2)→L4(1)
48: -(L1(1)*L2(3)-L1(3)*L2(1))→L4(2)
49: L1(1)*L2(2)-L1(2)*L2(1)→L4(3)
50: Disp "CROSS PRODUCT="
51: Disp "I   J   K"
52: Pause L4
53: Goto 5
54: Lbl 30
55: L1→L5
56: L2→L1
57: L5→L2
58: Pause "SWAPPED L1,L2"
59: Goto 5
60: Lbl 35
61: Disp "L1"
62: Pause L1
63: Disp "L2"
64: Pause L2
65: Disp "L4"
66: Pause L4
67: Goto 5
68: Lbl 40
69: Menu("MENU 2", "MGNTD L1,L2", 45, "ANGLE L1,L2", 50, "UNIT L1,L2",
      55, "DIRECTIONAL", 60, "PRJCT L1 ON L2", 65, "MENU 1", 5, "QUIT", 99)
70: Lbl 45
71: √(sum(L1*L1))→A
72: √(sum(L2*L2))→B
73: Disp "MAGNITUDE L1", A
74: Disp "MAGNITUDE L2"
75: Pause B
76: Goto 40
77: Lbl 50
78: Radian
79: cos-1(sum(L1*L2)/√(sum(L1*L1)*sum(L2*L2)))→C
80: Disp "ANGLE L1 AND L2", "IN RADIANS"
81: Pause C

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82: Disp "IN DEGREES"
83: Pause C*180/π
84: Goto 40
85: Lbl 55
86: √(sum(L1*L1))→A
87: √(sum(L2*L2))→B
88: (1/A)*L1→L5
89: (1/B)*L2→L6
90: Disp "UNIT IN L1 DIR"
91: Pause L5
92: Disp "UNIT IN L2 DIR"
93: Pause L6
94: Goto 40
95: Lbl 60
96: Radian
97: √(sum(L1*L1))→A
98: √(sum(L2*L2))→B
99: cos-1(L1/A)→L5
100: cos-1(L2/B)→L6
101: Disp "IN RADIANS"
102: Disp "L1 DIR ANGLES", "ALPHA, BETA, GAMMA"
103: Pause L5
104: (180/π)*L5→L5
105: Disp "IN DEGREES"
106: Pause L5
107: Disp "IN RADIANS", "L2 DIR ANGLES", "ALPHA, BETA, GAMMA"
108: Pause L6
109: Disp "IN DEGREES"
110: (180/π)*L6→L6
111: Pause L6
112: Goto 40
113: Lbl 65
114: (sum(L1*L2)/sum(L2*L2))*L2→L5
115: Disp "Project L1 ONTO L2"
116: Pause L5
117: Goto 40
118: Lbl 99
119: Float
120: Stop
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