1) A machined block is resting on a ramp feeder on a small table in a robot work cell as shown below. Determine the location and attitude of block 8 with respect to global coordinate frame 1. Ensure that your attitude matrix is positive orthonormal.



Download "skew sym.m" from our class web page and calculate $[\tilde{a}]{b}$ to check your work.

EXTRA CREDIT

Local coordinates of five landmarks A,B,C,D,E on rigid body 7 are given below. Unfortunately, landmark labeling was scrambled when global pose of this object was measured, and the five global locations 1,2,3,4,5 shown below cannot be associated sequentially with the landmarks (i.e. global location 2 may refer to landmark D). Further, there was a measurement error, and one of the global locations is completely wrong.

LANDMARK	local x ₇ '	local y ₇ '	local z ₇ '
А	0	0	0
В	0	0	3
С	2	0	0
D	0	1	0
E	0	0	-4
LOCATION	global x ₁ '	global y ₁ '	global z ₁ '
1	2.574	-3.482	2.146
2	2.000	-3.000	4.000
3	2.510	-2.142	3.935
4	-1.244	-1.184	2.524
5	4.433	-4.362	1.107
LOCATION 1 2 3 4 5	global x ₁ ' 2.574 2.000 2.510 -1.244 4.433	global y ₁ ' -3.482 -3.000 -2.142 -1.184 -4.362	global z ₁ 2.146 4.000 3.935 2.524 1.107

a) Match the global locations to their respective landmarks.

local landmark	А	В	С	D	Е
global location					

b) Identify the incorrect global location and state why.

c) Using the correct global locations, describe the pose of object 7 in global coordinates.

