2b)

```
function outMat = homogeneousMatrix(x,y,theta)
    outMat = [cos(theta) -sin(theta) x; sin(theta) cos(theta) y; 0 0 1];
end

function outMat = homogeneousInverse(outMat)
    rotation_transpose = transpose(outMat(1:2,1:2));
    outMat = [rotation_transpose, -rotation_transpose*outMat(1:2,3); 0 0 1];
end
l1 = 3/4;
l2 = 1/2;
alpha = NaN([1,4]);
g_we = @(alpha)
homogeneousMatrix(0,0,alpha(1))*homogeneousMatrix(alpha(2),0,0)*homogeneousMatrix(l1
,0,alpha(3))*homogeneousMatrix(l2,0,alpha(4))
```

```
g_we = function_handle with value:
    @(alpha)homogeneousMatrix(0,0,alpha(1))*homogeneousMatrix(alpha(2),0,0)*homogeneousMatrix(l1,0,alpha(3))*homogen
```

```
alpha = [pi/4, 3/4, pi/4, pi/3];
g_we1 = g_we(alpha);
fprintf("Transform g_we1 = ([%.2f, %.2f], R(%.2f
rad)",g_we1(1,3),g_we1(2,3),atan2(g_we1(2,1),g_we1(1,1)));
```

```
Transform g_we1' = ([1.06, 1.56], R(2.62 rad)
```

```
alpha = [-pi/3, 1, -pi/6, pi/4];
g_we2 = g_we(alpha);
fprintf("Transform g_we2 = ([%.2f, %.2f], R(%.2f
rad)",g_we2(1,3),g_we2(2,3),atan2(g_we2(2,1),g_we2(1,1)));
```

```
Transform g_we2' = ([0.88, -2.02], R(-0.79 rad)
```