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In[87]:= a = {{4, 3, 2}, {3, 4, -2}}; b = {-10, 9};
{u, w, v} = SingularValueDecomposition[a]
u.w.Transpose[v]
f[x_] := If[x == 0, 0, 1/x]; SetAttributes[f, Listable];
w1 = f[Transpose[w]];
xx = v.w1.Transpose[u].b
Clear[x, y, z]; r = Thread[a.{x, y, z} == b];
d = 7;
Show[ContourPlot3D[Evaluate[r], {x, -d, d}, {y, -d, d}, {z, -d, d}],
Graphics3D[{Red, PointSize[0.05], Sphere[xx]}]]

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Out[88]= {{{{1/sqrt(2), -1/sqrt(2)}, {1/sqrt(2), 1/sqrt(2)}}, {{7, 0, 0}, {0, 3, 0}},
{{1/sqrt(2), -1/(3*sqrt(2)), -2/3}, {1/sqrt(2), 1/(3*sqrt(2)), 2/3}, {0, -2*sqrt(2)/3, 1/3}}}

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Out[89]= {{4, 3, 2}, {3, 4, -2}}

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Out[92]= {-71/63, 62/63, -38/9}

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