- Discuss finding an inverse via Gauss-Jordan Elimination.
- Discuss rotation matrices.

$$R_\theta = \begin{pmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{pmatrix}$$

Note that

$$\det(R_\theta) = \cos^2\theta + \sin^2\theta = 1$$

so

$$R_\theta^{-1} = \begin{pmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{pmatrix}$$

Check It!

Proposition 1. *Suppose that A and AB are invertible. Then B is also invertible.*

Proof. Since A is invertible, there exists A^{-1} such that $A^{-1}A = AA^{-1} = I$ Similarly, AB is invertible so there exists some C such that $C(AB) = (AB)C = I$. By using the associativity of matrix multiplication, we get $C(AB) = (CA)B = I$, and therefore B has an inverse. □