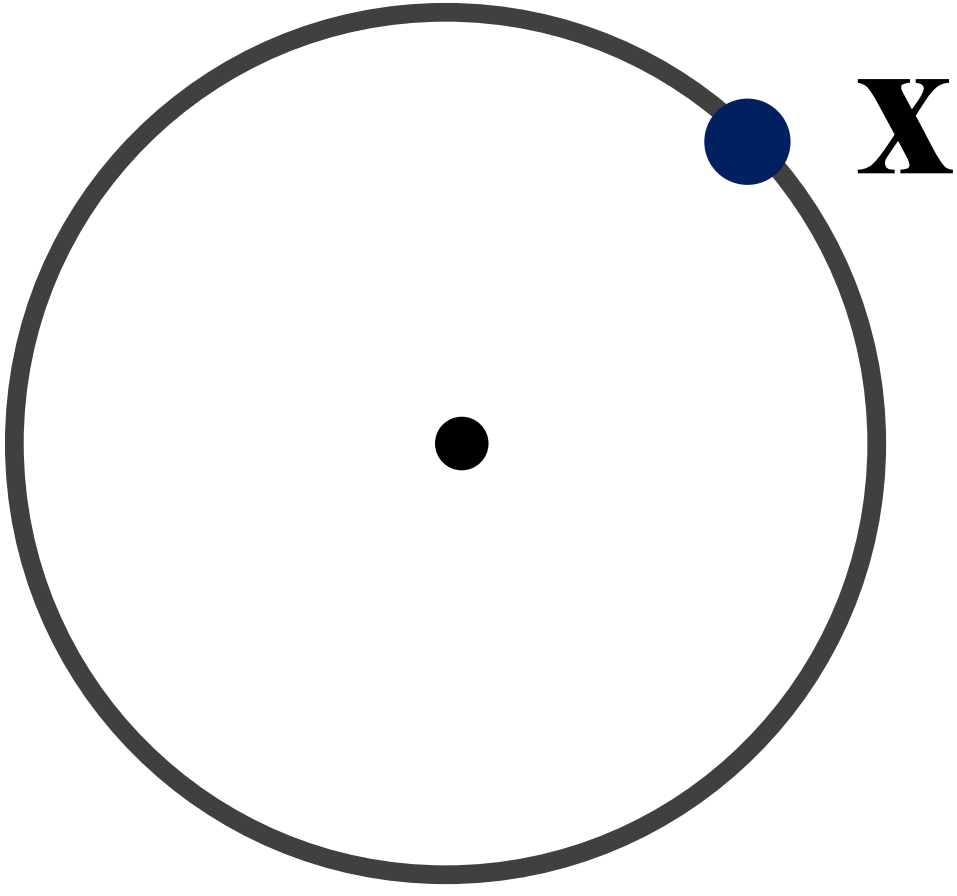


$$C(\mathbf{x}) = \frac{1}{2}(\mathbf{x} \cdot \mathbf{x} - 1)$$

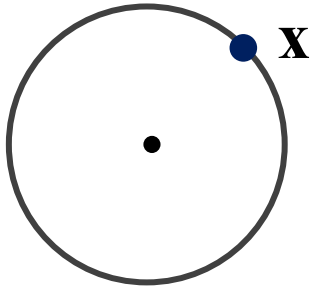
Computing Constraint Forces

Legal acceleration (1)

$$C(\mathbf{x}) \quad \mathbf{x}\cdot\mathbf{x} \quad \mathbf{x}\cdot\mathbf{x} \quad \mathbf{x}\cdot\mathbf{x} \quad 0$$

Newton's Law

$$\mathbf{x} \quad \frac{\mathbf{F} \quad \mathbf{F}^C}{m} \quad (2)$$



$$C(\mathbf{x}) = \tfrac{1}{2}(\mathbf{x}\cdot\mathbf{x} - 1)$$

- Use (2) in (1)

$$\mathbf{F}^C \quad \mathbf{x} \quad \mathbf{F} \quad \mathbf{x} \quad m\mathbf{x} \quad \mathbf{x} \quad (3)$$

- Require constraint force to act only in gradient direction

$$\mathbf{F}^C \quad \frac{C}{\mathbf{x}} \quad \mathbf{x} \quad (4)$$

- Use (4) in (3)

$$\frac{\mathbf{F} \quad \mathbf{x} \quad m\mathbf{x} \quad \mathbf{x}}{\mathbf{x} \quad \mathbf{x}}$$

⇨ hard constraint force!