Plot how force of friction varies w. Applied Force

\( F_{\text{friction}} \) vs. Force vector (e.g., force on box on floor):

- \( F_{\text{friction}} = \mu_s |N| \)
  - \( \mu_k < \mu_s \) always

- \( F_{\text{friction}} \) up to \( F_{\text{max}} = \mu_s |N| = \mu_s Mg \)

**Magnitude of Frictional Force:**

- Object at Rest: \( |\vec{F}_{\text{static}}| = |\vec{F}_{\text{Applied}}| \leq \mu_s |\vec{N}| = \mu_s Mg = |\vec{F}_{\text{static}}| \)

- Object Sliding: \( |\vec{F}_{\text{friction}}| = \mu_k |\vec{N}| = \mu_k Mg \) (< \( \mu_s Mg \), always)

Once \( |\vec{F}_{\text{Applied}}| \) exceeds \( |\vec{F}_{\text{static}}| \),

Object begins to slide and to Accelerate by \( \vec{a} \),

Since \( \text{Net Force} = \vec{F}_{\text{Applied}} - \vec{F}_{\text{friction}} > 0 \).