SLIDING MOTION; FORCE

$F \} uWA$

F = Force (lbs)
u = Coef. of Fric.
W = Surface Weight (lbs)
A = Area of Contact (in^2)

Torque:

$$T = FR$$

Where:
T = Torque (lb-ft)
F = Force (lb)
R = Radius, or distance that the force is from the pivotal point (ft)

Linear to rotary motion:

$$N = \frac{V}{0.262D}$$

Where:
N = Speed of shaft rotation (rpm)
V = Velocity of material (fpm)
D = Diameter of pully or sprocket (in)

Horsepower:

- **Rotating objects:**

$$P = \frac{TN}{5250}$$

Where:
P = Power (hp)
T = Torque (lb-ft)
N = Shaft speed (rpm)

- **Objects in linear motion:**

$$P = \frac{FV}{33{,}000}$$

Where:
P = Power (hp)
F = Force (lb)
V = Velocity (fpm)

Modulus of elasticity:

$$E = \frac{PL}{A\triangle d}$$

Where:
E = Modulus of elasticity (lb/in^2)
P = Axial load (lb)
L = Length of object (in)
A = Area of object (in^2)
$\triangle d$ = Increase in length resulting from axial load (in)