Problem 3-9

Cords $AB$ and $AC$ can each sustain a maximum tension of $T$. If the drum has a weight $W$, determine the smallest angle $\theta$ at which they can be attached to the drum.

Units Used:

$\text{lb} := 0.454 \text{kg}$

Given:

$T := 800 \text{lb}$

$W := 900 \text{lb}$

Problem 3-19

The cords $BCA$ and $CD$ can each support a maximum load of $T$. Determine the maximum weight of the crate that can be hoisted at constant velocity, and the angle $\theta$ for equilibrium.

Units Used:

$\text{lb} := 0.454 \text{kg}$

Given:

$T := 100 \text{lb}$

$c := 12$

$d := 5$
Problem 3-37

The lamp fixture weighs \( W \) and is suspended from two springs, each having an unstretched length of \( L \) and stiffness of \( k \). Determine the angle \( \theta \) for equilibrium.

Units Used:

\[ kN := 1000N \]

Given:

\( W := 10lb \)

\( l := 4ft \)

\( k := 5 \frac{lb}{ft} \)

\( a := 4ft \)

Problem 3-57

Determine the height \( d \) of cable \( AB \) so that the force in cables \( AD \) and \( AC \) is one-half as great as the force in cable \( AB \). What is the force in each cable for this case? The flowerpot has mass \( m_p \).

Given:

\( m_p := 50kg \)

\( c := 3m \)

\( a := 2m \)

\( b := a \)

\( f := 6m \)

\( e := 6m \)

\( g := 9.81 \frac{m}{s^2} \)
Problem 3-64

The ball of weight $W$ is suspended from the horizontal ring using three springs each having an unstretched length $\delta$ and stiffness $k$. Determine the vertical distance $h$ from the ring to point $A$ for equilibrium.

Units Used:

Given:

$W := 80\text{lb}$

$\delta := 1.5\text{ft}$

$k := 50 \frac{\text{lb}}{\text{ft}}$

$r := 1.5\text{ft}$