GEN_ENG_205-2 – Engineering Analysis II
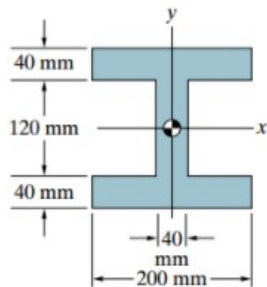
HOMEWORK 1

1.5 The Burj Dubai, scheduled for completion in 2008, will be the world's tallest building with a height of 705 m. The area of its ground footprint will be 8000 m². Convert its height and footprint area to U.S. Customary units to three significant digits.

Problem 1.5

1.14 Determine the cross-sectional area of the beam (a) in m²; (b) in in².

Problem 1.14

1.25 The acceleration due to gravity at sea level is $g = 9.81 \ m/s^2$.

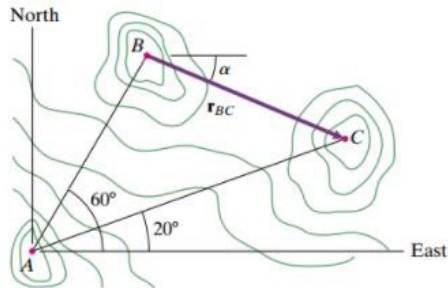The radius of the earth is 6370 km. The universal gravitational

constant $G = 6.67 \ x \ 10^{-11} \ N * m^2/kg^2$. Use this information to

determine the mass of the earth.

2.14 A surveyor determines that the horizontal distance from A to B is 400 m and the horizontal distance from A to C is 600 m. Graphically determine the magnitude of the vector $\mathbf{r}_{BC}$ and the angle α.

North

α

$\mathbf{r}_{BC}$

B

C

$60°$

$20°$

East

A

Problem 2.14

2.41 A surveyor finds that the length of the line OA is 1500 m and the length of the line OB is 2000 m.

(a) Determine the components of the position vector from point A to point B.

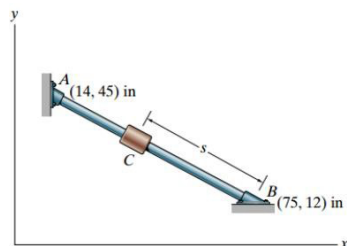(b) Determine the components of a unit vector that points from point A toward point B.

y

A Proposed bridge

B

N

$60°$

$30°$

River

x

O
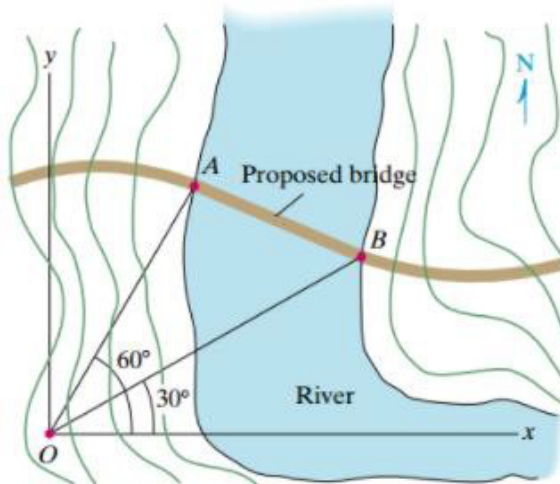
Problem 2.41

GEN_ENG_205-2 – Engineering Analysis II

HOMEWORK 1

2.57 The distance s = 45 in.

(a) Determine the unit vector e_{BA} that points from B toward A.

(b) Use the unit vector you obtained in (a) to determine the coordinates of the collar C.
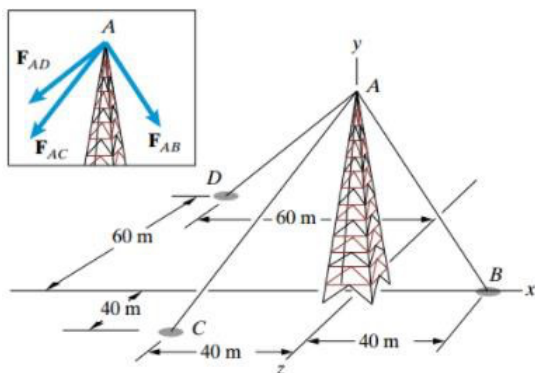

Problems 2.57/2.58

2.78 Archaeologists measure a pre-Columbian ceremonial structure and obtain the dimensions shown. Determine (a) the magnitude and (b) the direction cosines of the position vector from point A to point B.
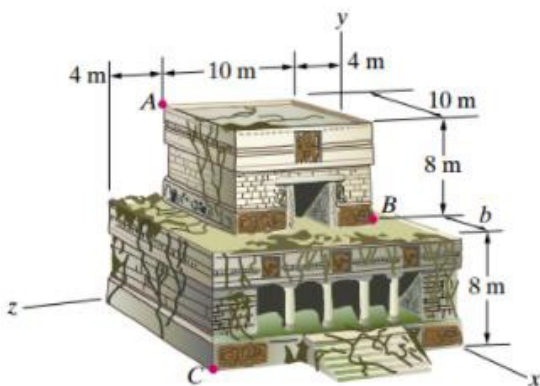
Problem 2.78

2.94 The magnitude of the force F_{AB} is 2 kN. The x and z components of the vector sum of the forces exerted on the tower by the three cables are zero. What are the magnitudes of F_{AC} and F_{AD}? (The tower is 70 -m tall.)

Problems 2.93/2.94