Answers to MEEG 2003 Test IIb

1.

(*a*) $T_{EF} = 7$ kN
(*b*) $\mathbf{A} = -13\mathbf{i} + 3\mathbf{j} + 6.25\mathbf{k}$ kN
(*c*) $\mathbf{M}_A = -6\mathbf{i} - 2.5\mathbf{j}$ kN·m

2.

(*a*) $\mathbf{M}_E = 40$ kip·ft ↺
(*b*) $\mathbf{A}_x = 65$ kips ←

3.

A. (*b*)
B. (*a*)
C. (*d*)

4.

A. The **first theorem of Pappus-Guldinus** states that the area of any surface of revolution is equal to the length of the generating curve times the distance traveled by the centroid of the generating curve in generating the area.

B. The **work of a force** on a body is equal to the force acting on the body times the displacement of the body in the direction of the force.

C. The **work of a moment** on a body is equal to the moment acting on the body times the angular displacement (in radians) of the body in the direction of the moment.

D. To determine *a specific unknown* in the free-body diagram using *virtual work method*, the general **strategy** (or *guide*) employed in drawing the **virtual displacement diagram** is to give the free body a compatible virtual displacement in such a way that the *one* specified unknown, but *no other unknowns*, will be involved in the total virtual work done.