2. You are installing a new spark plug in your car, and the manual specifies that it be tightened a torque that has a magnitude of 45 N m. Using the data in the drawing, determine the magnitude $F$ of the force that you must exert on the wrench.

6. The drawing shows a jet engine suspended beneath the wing of an airplane. The weight $W$ of the engine is 10,200 N and acts as shown in the drawing. In flight the engine produces a thrust $T$ of 62,300 N that is parallel to the ground. The rotational axis in the drawing is perpendicular to the plane of the paper. With respect to this axis, find the magnitude of the torque due to (a) the weight and (b) the thrust.

16. A lunch tray is being held in one hand, as the drawing illustrates. The mass of the tray itself is 0.200 kg, and its center of gravity is located at its geometric center. On the tray is a 1.00-kg plate of food and a 0.250-kg cup of coffee. Obtain the force exerted by the thumb, $F_T$, and the force exerted by the four fingers, $F_F$. Both forces act perpendicular to the tray, which is being held parallel to the ground.

22. A person is sitting with one leg outstretched so that it makes an angle of $30.0^\circ$ with the horizontal, as the drawing indicates. The weight of the leg below the knee is 44.5 N with the center of gravity located below the knee joint. The leg is being held in this position because of the force $M$ applied by the quadriceps muscle, which is attached 0.100 m below the knee joint (see the drawing). Obtain the magnitude of $M$. 