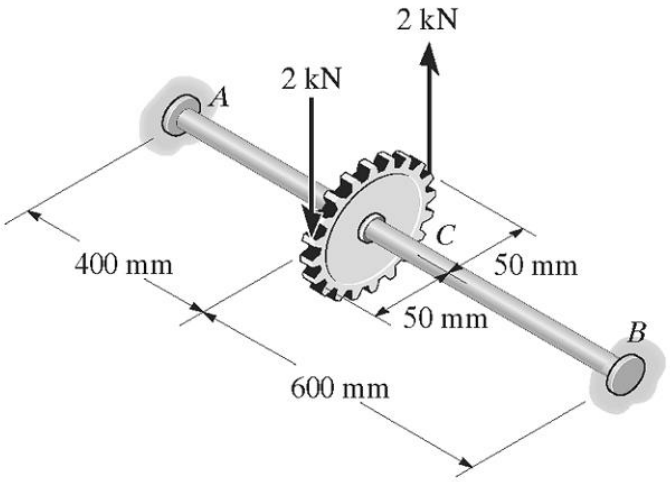
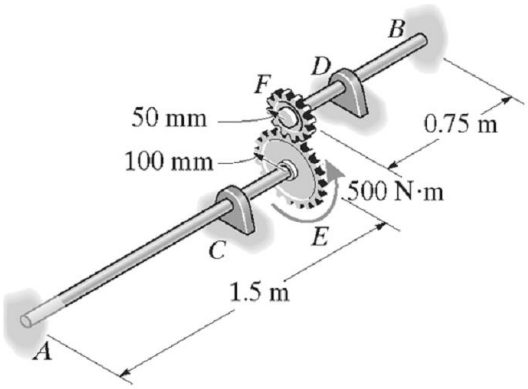
1. The shaft is made of tool steel, has a diameter of 40 mm, and is fixed at its ends *A* and *B*. If it is subjected to the couple shown, determine the maximum shear stress in regions *AC* and *CB*.



2. The two shafts are made of steel. Each has a diameter of 25 mm and they are connected using the gears fixed to their ends. Their other ends are attached to fixed supports at *A* and *B*. They are also supported by journal bearings at *C* and *D*, which allow free rotation of the shafts along their axes. If a torque of 500 N·m is applied to the gear *E* as shown, determine the reactions at *A* and *B*.



3. The shaft of radius *c* is subjected to a distributed torque *t*, measured as torque/length of shaft. Determine the reactions at the fixed supports *A* and *B*.