

## **Solution to “Symmetric lens for video camera”**

1.  $f_1=45\text{mm}$   $F_2F_1'=-45\text{mm}$   $O_2F_1'=15\text{mm}$ . H and F are symmetric with respect to the middle of the 2 lenses.
2. The center of symmetry of the system O is where the pupil is located. Entrance pupil in H, exit pupil in H', same diameter 16.875mm for both pupils. F-number=2.7
3. diagonal of the CCD=14.48mm<diameter of bright field. Diameter L2>15.28mm. Diameter L1>26.53mm
4. drawing
5. hyperfocal distance: 38m
6. The lens should be moved towards the object (away from the CCD) by 0.405mm.
7. Depth of field 1.33m (between 4.42m and 5.75m)