

27. We make the assumption that the clouds are directly overhead, so that Figure 1-3 (and the calculations that accompany it) apply. Following the steps in Sample Problem 1-4, we have

$$\frac{\theta}{360^\circ} = \frac{t}{24 \text{ h}}$$

which, for $t = 38 \text{ min} = 38/60 \text{ h}$ yields $\theta = 9.5^\circ$. We obtain the altitude h from the relation

$$d^2 = r^2 \tan^2 \theta = 2rh$$

which is discussed in that Sample Problem, where $r = 6.37 \times 10^6 \text{ m}$ is the radius of the earth. Therefore, $h = 8.9 \times 10^4 \text{ m}$.