

60. The altitude H and the horizontal distance x for the legs of a right triangle, so we have

$$H = x \tan \theta = v_p t \tan \theta = 1.25vt \sin \theta$$

where v is the speed of sound, v_p is the speed of the plane and

$$\theta = \sin^{-1} \left(\frac{v}{v_p} \right) = \sin^{-1} \left(\frac{v}{1.25v} \right) = 53.1^\circ .$$

Thus the altitude is

$$H = x \tan \theta = (1.25)(330 \text{ m/s})(60 \text{ s})(\tan 53.1^\circ) = 3.30 \times 10^4 \text{ m} .$$