

15.7

Picture

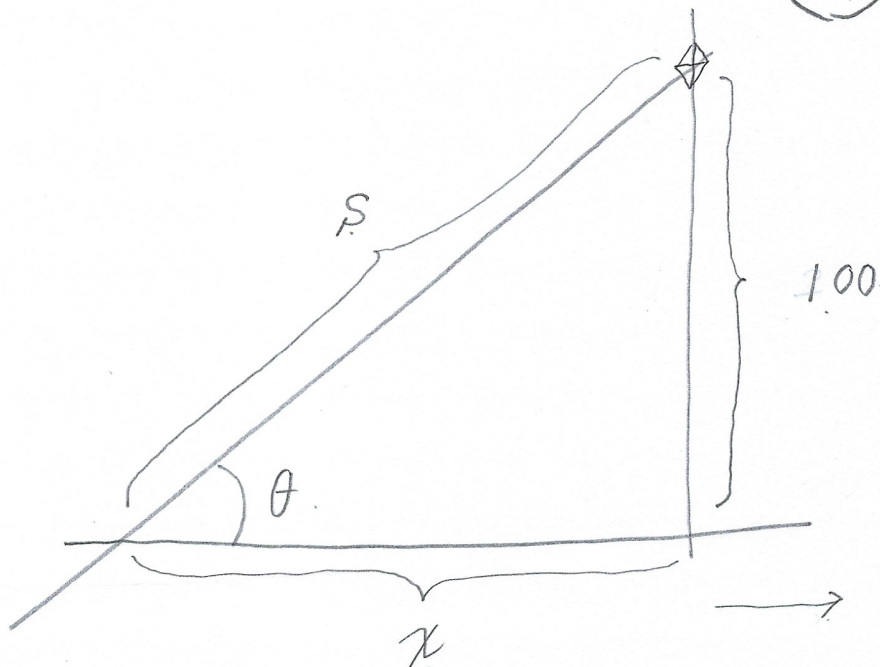
(59)

Given

$$\frac{dx}{dt} = 3$$

Unknown

$$\frac{d\theta}{dt} = ?$$

when  $S = 200$ .

Relation

$$\frac{100}{x} = \tan \theta \quad \text{i.e.} \quad 100 = x \tan \theta$$

Solution

$$0 = \frac{dx}{dt} \cdot \tan \theta + x \cdot \sec^2 \theta \cdot \frac{d\theta}{dt}$$

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$$3 \quad \frac{1}{\sqrt{3}} \quad 100\sqrt{3} \quad \frac{2}{\sqrt{3}}$$

$$\text{i.e.} \quad \sqrt{3} + \frac{400}{\sqrt{3}} \frac{d\theta}{dt} = 0 \quad \frac{d\theta}{dt} = -\frac{3}{400}$$

Ans. The angle is decreasing at  $\frac{3}{400}$  rad./sec.