

p. 65 #7



Find $\frac{d\theta}{dt}$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan \theta = \frac{a}{3000}$$

$$\tan \theta = \frac{19}{3000}$$

$$\sec \theta = \frac{1}{\cos \theta} = \frac{h}{a}$$

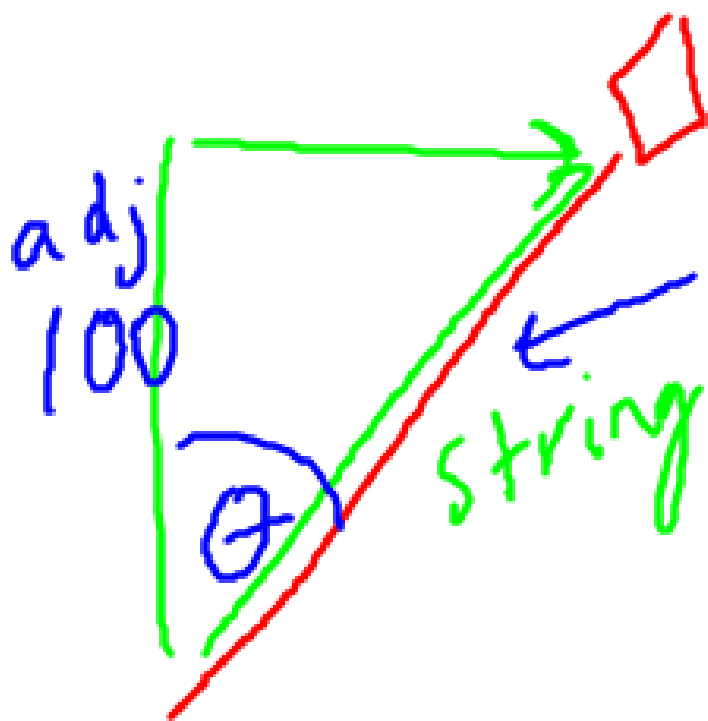
$$\sec^2 \theta \cdot \frac{d\theta}{dt} = \frac{1}{3000} \cdot \frac{da}{dt}$$

$$\left(\frac{5000}{3000}\right)^2 \frac{d\theta}{dt} = \frac{1}{3000} (800)$$
$$\frac{d\theta}{dt} = .096 \frac{\text{radians}}{\text{sec}}$$

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Find $\frac{d\theta}{dt}$



$$\frac{dc}{dt} = 10$$

use \cos

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$
$$\cos \theta = \frac{100}{c}$$

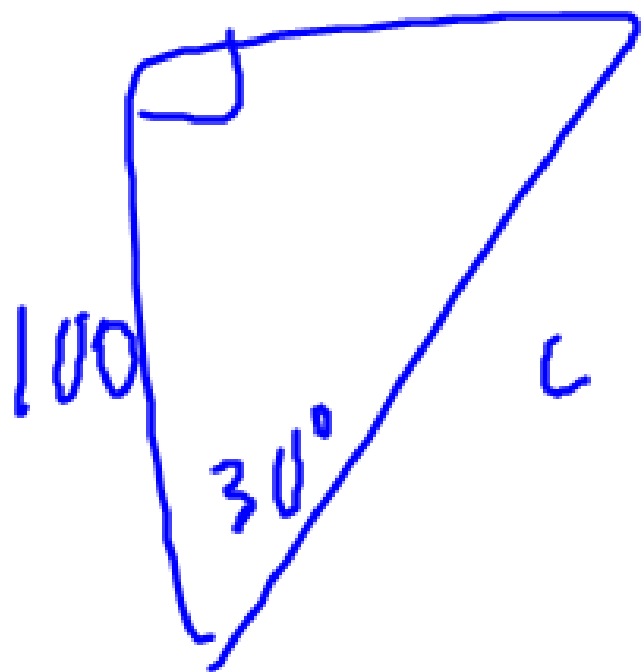
$$\cos \theta = \frac{100}{c} \quad 100 \text{ c}^{-1}$$

$$-\sin \theta \cdot \frac{d\theta}{dt} = \frac{-100}{c^2} \cdot \frac{dc}{dt}$$

$$-\sin 30^\circ \cdot \frac{d\theta}{dt} = \frac{-100}{\left(\frac{100}{\cos 30^\circ}\right)^2} \cdot 10$$

see next page for finding c

$$\frac{d\theta}{dt} \approx 0.15 \frac{\text{rad}}{\text{sec}}$$



$$\cos 30^\circ = \frac{100}{c}$$

$$c = \frac{100}{\cos 30^\circ}$$

② p. 69

plane

4000

b

c

2000

a

light

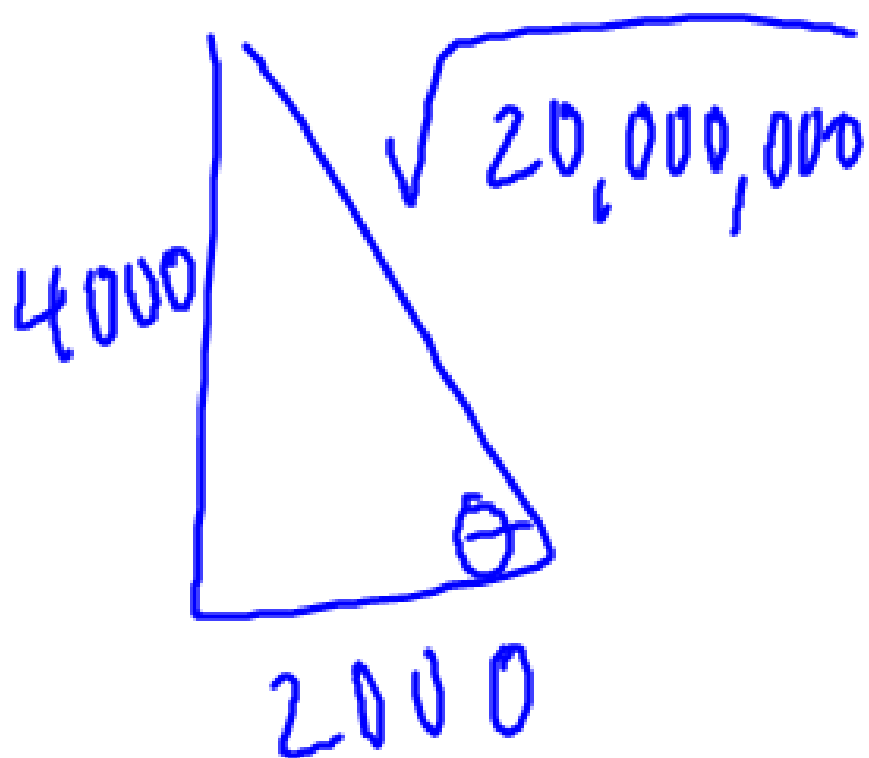
$$\frac{da}{dt} = 500$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan \theta = \frac{4000}{a}$$

$$\tan \theta = \frac{4000}{a}$$

$$\sec^2 \theta \cdot \frac{d\theta}{dt} = \frac{-4000}{a^2} \cdot \frac{da}{dt}$$



$$\left(\frac{\sqrt{20000000}}{2000} \right)^2 \cdot \frac{d\theta}{dt} = \frac{-4000}{(2000)^2} \cdot 500$$

$$\frac{d\theta}{dt} \approx -0.1 \frac{\text{rad}}{\text{sec}}$$

$$\left(\frac{\sqrt{20000000}}{2000} \right)^2$$