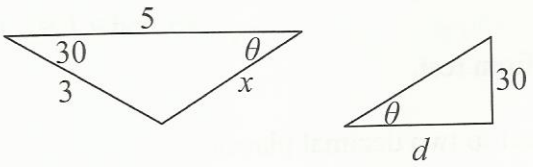
Some Alternative Solutions

2 (b)



$$x^2 = 3^2 + 5^2 - 2(3)(5)\cos 30$$
$$x = 2.832$$

$$\frac{\sin\theta}{3} = \frac{\sin 30}{2.832}$$
$$\theta = 31.985°$$

$$\tan 31.985° = \frac{30}{d}$$
$$d = 48.04 \text{ m}$$

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3 (b)

$r_j = 0$ on inclined plane

$$0 = u\sin(\theta - 45).t - \tfrac{1}{2}g\cos 45.t^2$$
$$\Rightarrow \quad t = \frac{2u\sin(\theta - 45)}{g\cos 45}$$

Consider horizontal plane

$$v_j = 0$$
$$0 = u\sin\theta - gt$$
$$\Rightarrow \quad t = \frac{u\sin\theta}{g}$$

$$t = t$$
$$\frac{u\sin\theta}{g} = \frac{2u\sin(\theta - 45)}{g\cos 45}$$
$$\sin\theta = 2\sqrt{2}\left\{\sin\theta\left(\frac{1}{\sqrt{2}}\right) - \cos\theta\left(\frac{1}{\sqrt{2}}\right)\right\}$$
$$\sin\theta = 2\sin\theta - 2\cos\theta$$
$$\Rightarrow \tan\theta = 2$$

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