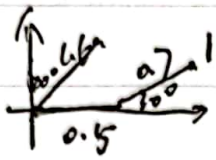
Ch. 3.

28.



建立坐标系 对于 beetle 1 $\vec{x_1} = (\frac{1}{2}, 0)$ $\vec{x_2} = (0.7\cos 30°, 0.7\sin 30°)$

对于 beetle 2 $\vec{y_1} = (1.6\sin 60°, 1.6\cos 60°)$

$\vec{x_1} + \vec{x_2} = \vec{y_1} + \vec{y_2}$

$\therefore \vec{y_2} = (\frac{1}{2} + 0.7\cos 30° - 1.6\sin 60°, 0.7\sin 30° - 1.6\cos 60°)$

$\approx (0.08, -0.88)$.

$|\vec{y_2}| \approx 0.78m$ 方向大约东偏南 arctan 11 度).

32. $|\vec{a}\times\vec{b}| = 12$ 方向垂直纸面向外

$|\vec{a}\times\vec{c}| = 4\times 5\times\frac{3}{5} = 12$ 方向垂直纸面向里.

$|\vec{b}\times\vec{c}| = 3\times 5\times\frac{5}{5} = 12$ 方向垂直纸面向外.

42. $\vec{d_1}\times\vec{d_2} = (4\hat{i}+5\hat{j})\times(-3\hat{i}+4\hat{j})$

$= 16\hat{i}\hat{j} - 15\hat{i}\hat{j} = \hat{i}\hat{j}$ 方向垂直纸面向外

$\vec{d_1}\cdot\vec{d_2} = -12+20 = 8$

$(\vec{d_1}+\vec{d_2})\cdot\vec{d_2} = (\hat{i}+9\hat{j})\times(-3\hat{i}+\hat{j}) = -3+36 = 33$

$|\vec{d}| = \sqrt{41}\times\left(\frac{4}{5}\times\frac{4}{\sqrt{41}} - \frac{3}{5}\times\frac{5}{\sqrt{41}}\right) = \frac{1}{5}$ 小 $\vec{d} = (-\frac{3}{25}m)\hat{i} + (\frac{4}{25}m)\hat{j}$