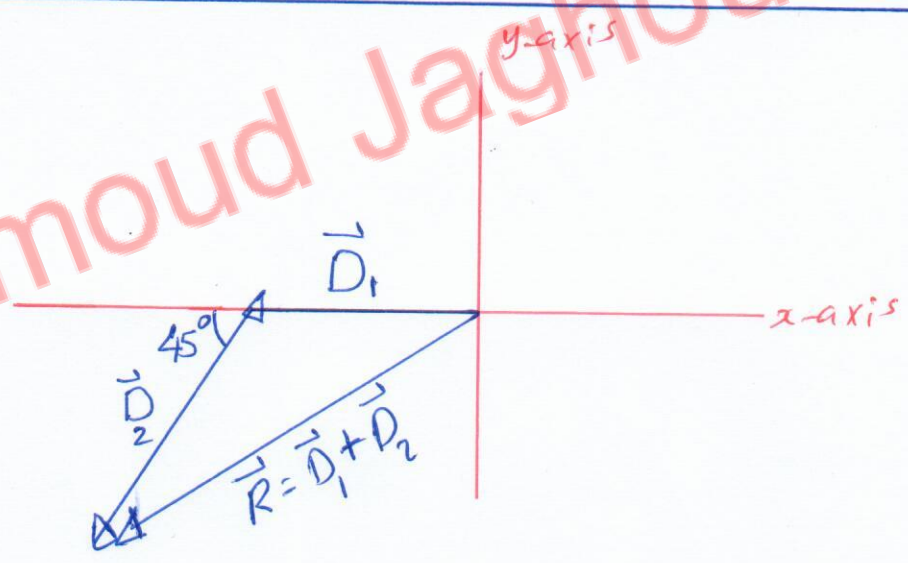


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Solutions for Chapter (3) / Giancoli / 7th edition
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Q1] $|\vec{D}_1| = 225 \text{ km}$
 $|\vec{D}_2| = 98 \text{ km}$

Southwest \Rightarrow
 $\theta = 45^\circ$



Resolve each displacement into x- and y-components.

$D_{1x} = -225 \text{ km}, D_{1y} = 0$

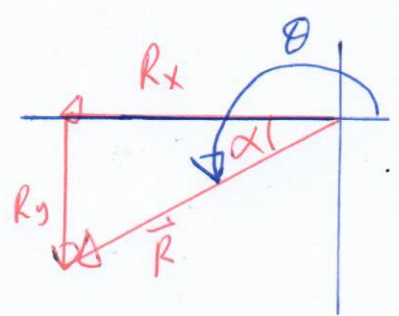
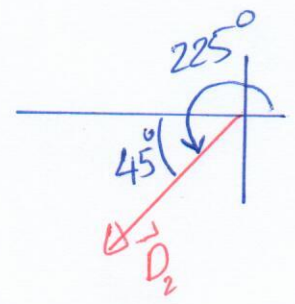
$D_{2x} = 98 \cos 225^\circ = -98 \cos 45^\circ = -69.3 \text{ km}$

$D_{2y} = 98 \sin 225^\circ = -98 \sin 45^\circ = -69.3 \text{ km}$

$R_x = D_{1x} + D_{2x} = -294.3 \text{ km}$

$R_y = D_{1y} + D_{2y} = -69.3 \text{ km}$

$R = \sqrt{R_x^2 + R_y^2} = 302.3 \text{ km}$



$\tan \alpha = \left| \frac{R_y}{R_x} \right|$
 $\Rightarrow \alpha = 13.25^\circ \Rightarrow \theta = \alpha + 180^\circ = 193.25^\circ$

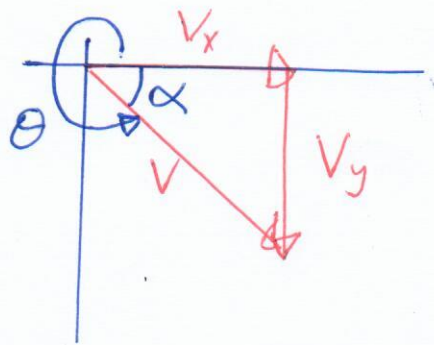
Q3] $V_x = 9.8$ units

$V_y = -6.4$ units.

\vec{V} lies in fourth quadrant.

$V = \sqrt{V_x^2 + V_y^2} = 11.7$ units.

$\tan \alpha = \left| \frac{V_y}{V_x} \right| \Rightarrow \alpha \sim 33.1^\circ \Rightarrow \theta = 360 - \alpha = 326.9^\circ$



Q8] $V_x = V \cos 131.5$

$= -V \sin 48.5$

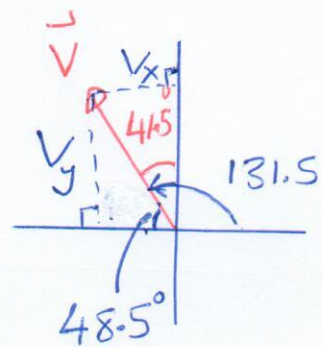
$= -V \cos 48.5$

$V_x = -553.3$ km/h.

$V_y = V \sin 131.5 = V \cos 48.5$

$= V \sin 48.5 = 625.4$ km/h

$V_y = 625.4$ km/h.

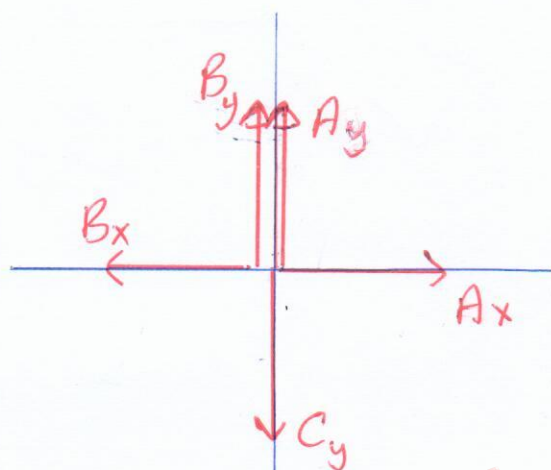
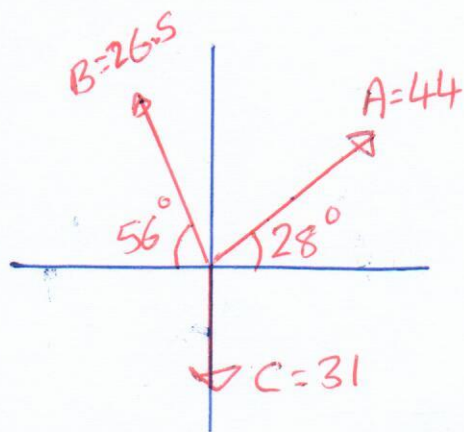


(a) $R_x = V_x t = -553.3 \times 1.75 = \downarrow 968.3$ km (west)

$R_y = V_y t = 625.4 \times 1.75 = 1094.5$ km (North)

Q12] Resolve vectors into components.

L3



$$A_x = A \cos 28^\circ = 38.8$$

$$A_y = A \sin 28^\circ = 20.7$$

$$B_x = -B \cos 56^\circ = -14.8, \quad B_y = B \sin 56^\circ = 22.0$$

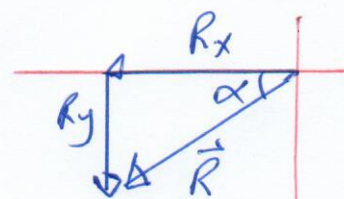
$$C_x = 0, \quad C_y = -31$$

a) $\vec{R} = \vec{B} - 3\vec{A}$

$$R_x = B_x - 3A_x = -131.2$$

$$R_y = B_y - 3A_y = -40.1$$

$$R = \sqrt{R_x^2 + R_y^2} \approx 137.2$$



$$\tan \alpha = \left| \frac{R_y}{R_x} \right| \Rightarrow \alpha \approx 17^\circ$$

$$\theta = \alpha + 180^\circ = 197^\circ$$

b) $\vec{R} = 2\vec{A} - 3\vec{B} + 2\vec{C}$

$$R_x = 2A_x - 3B_x + 2C_x = 122$$

$$R_y = 2A_y - 3B_y + 2C_y = -86.6$$

$$R = \sqrt{R_x^2 + R_y^2} = 149.6$$

$$\tan \alpha = \left| \frac{R_y}{R_x} \right| \Rightarrow \alpha = 35.4^\circ, \quad \theta = 360^\circ - \alpha = 324.6^\circ$$

