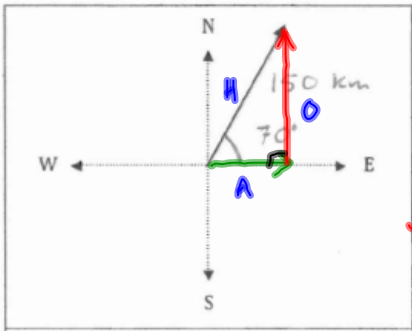
VECTOR COMPONENTS

Find the appropriate Vector Components



horizontal component:

$\cos(70) = \frac{A}{H}$

$\cos(70) = \frac{A}{150}$

$A = 150\cos(70)$

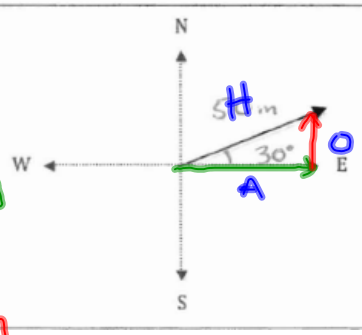
$\vec{d}_x = 51.3\text{ km [E]}$

vertical component:

$\sin(70) = \frac{O}{150}$

$O = 150\sin(70)$

$\vec{d}_y = 141\text{ km [N]}$



horizontal component:

$\cos(30) = \frac{A}{H}$

$A = 50\cos(30)$

$\vec{d}_x = 43\text{m [E]}$

vertical component:

$\sin(30) = \frac{O}{H}$

$O = 50\sin(30)$

$\vec{d}_y = 25\text{m [N]}$

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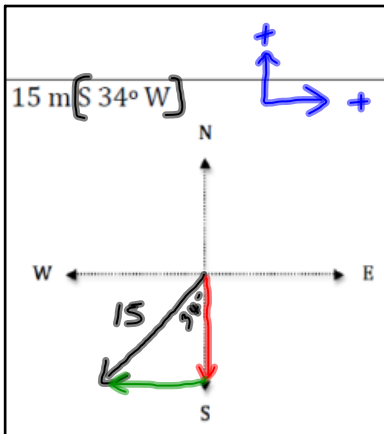
Adding Vector Components

15 m [S 34° W]



horizontal component:

$15\sin(34°)$

$= 8.4\text{m [W]}$

$= -8.4\text{m}$

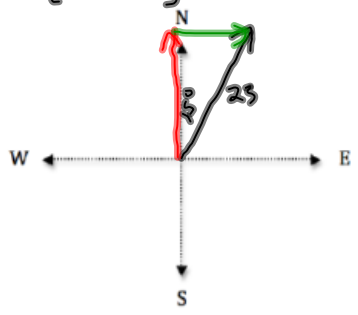
vertical component:

$15\cos(34)$

$= 12.4\text{m [S]}$

$= -12.4\text{m}$

25 m [15° E of N]



horizontal component:

$25\sin(15)$

$= 6.5\text{m [E]}$

$= +6.5\text{m}$

vertical component:

$25\cos(15)$

$= 24.1\text{m [N]}$

$= +24.1\text{m}$

Add the Left vector to the right vector

Resultant Horizontal: $-8.4\text{m} + 6.5\text{m}$

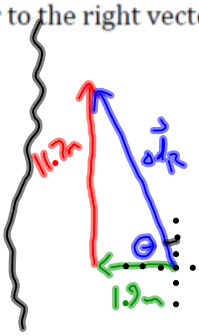
$= -1.9\text{m}$

$= 1.9\text{m [W]}$

Resultant Vertical: $-12.4\text{m} + 24.1\text{m}$

$= +11.7\text{m}$

$= 11.7\text{m [N]}$



$d_R = \sqrt{11.7^2 + 1.9^2}$

$= 11.8\text{ m}$

$\tan\theta = \frac{O}{A}$

$\tan\theta = \frac{11.7}{1.9}$

$\theta = \tan^{-1}\left(\frac{11.7}{1.9}\right) = 81°$

$\therefore \vec{d}_R = 11.8\text{m [N 9° W]}$

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