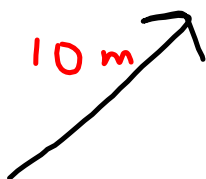


Science 10
Tuesday May 15th
Adding / Subtracting vectors
and angles.

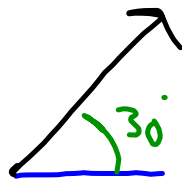
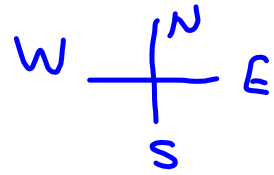
Vectors at an angle.

10 m E 30 N

- means you go 10 m in an East-North direction

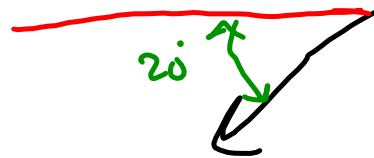


E 30 N
↑ ↑ ↗
go East turn 30° The North

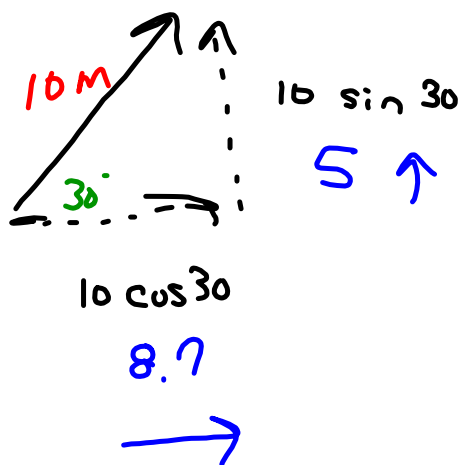


W 20 S

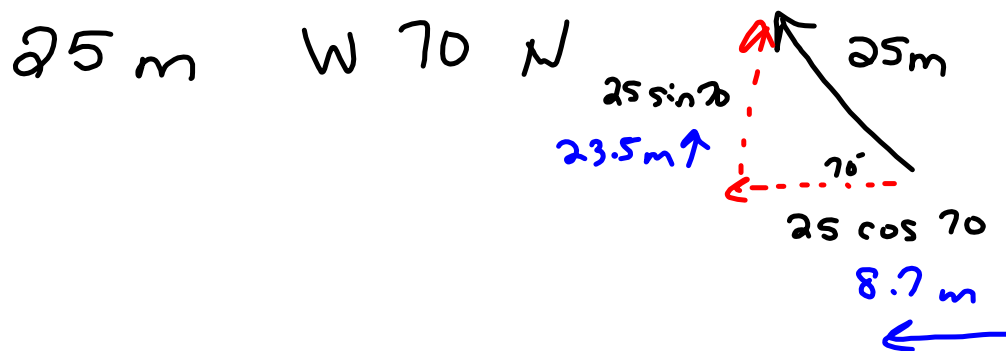
- go west and turn 20° to the South.



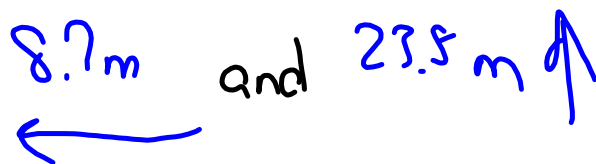
10 m E 30 N



So if we have a vector at an angle we need to break it up into its horizontal and vertical parts before adding or subtracting.

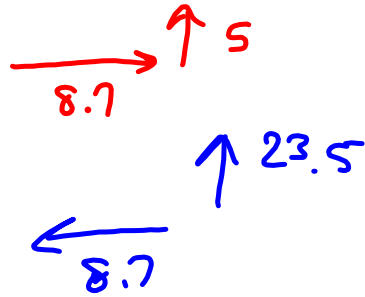


For adding and subtracting vectors
we want



$$\vec{V}_A = 10 \text{ m } E 30 N$$

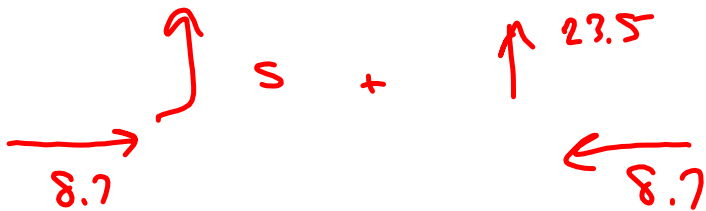
$$\vec{V}_B = 25 \text{ m } W 70 N$$



Adding

$$\vec{V}_A + \vec{V}_B$$

$$10 \text{ m } E 30 N + 25 \text{ m } W 70 N$$

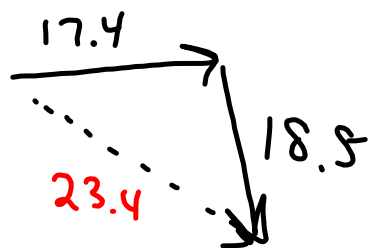
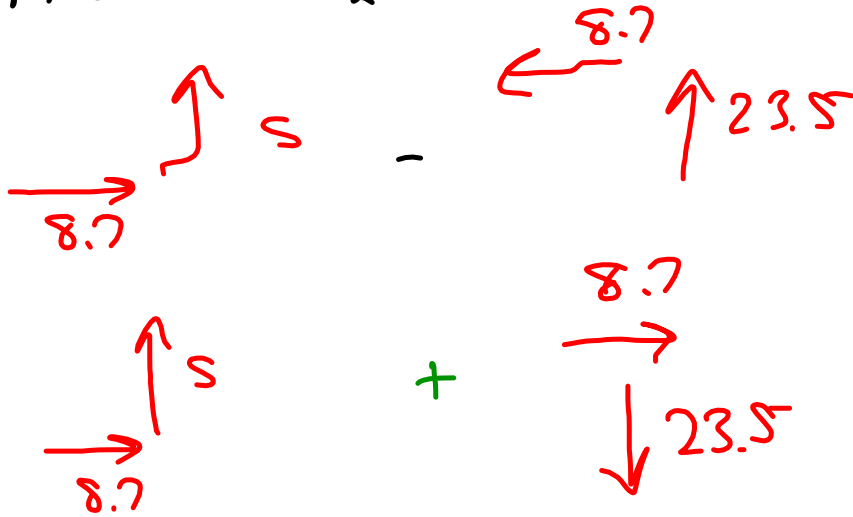


$$\uparrow 28.5 \text{ m}$$

28.5 m North

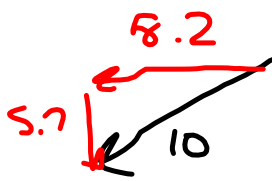
$$\vec{V}_A - \vec{V}_B$$

10 m E 30° N - 25 m W 70° N



23.4 m SE

$$\vec{V}_c = 10 \text{ m W } 35 \text{ S}$$

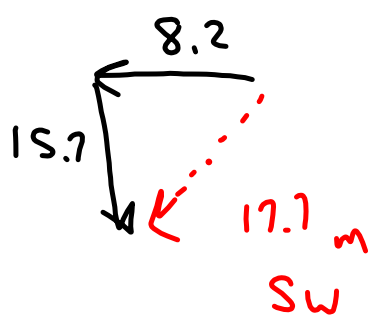

$$\vec{V}_D = 10 \text{ m South}$$

$$a) \vec{V}_D + \vec{V}_c$$

$$b) \vec{V}_D - \vec{V}_c$$

a) $\sum V_D + \sum V_C$

10 ↓ + 8.2 ← + 5.7 ↓

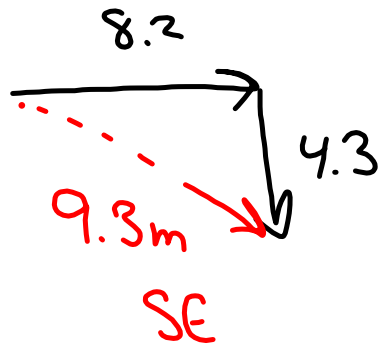
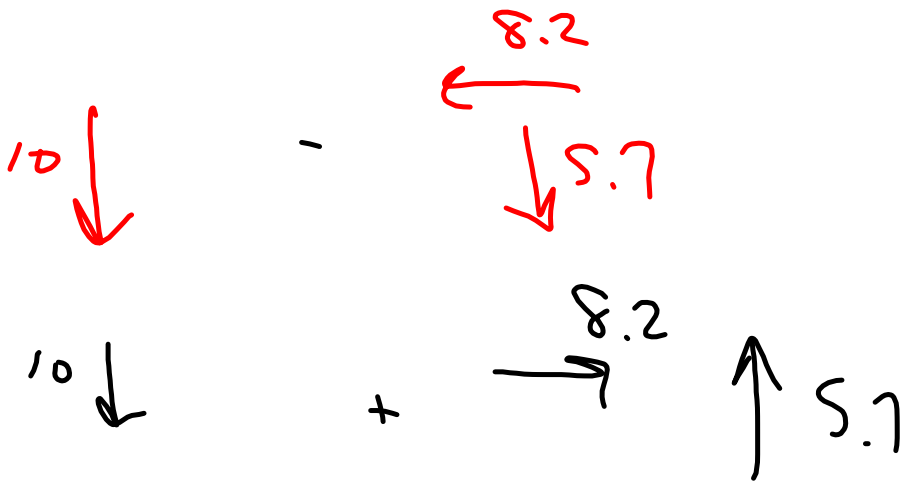


$$h^2 = 8.2^2 + 15.7^2$$

$$h = 17.7$$

b) $\vec{V}_D - \vec{V}_C$

10 m South - 10 m W35 S



$$h^2 = a^2 + b^2$$

$$h^2 = 8.2^2 + 4.3^2$$

$h = 9.3$