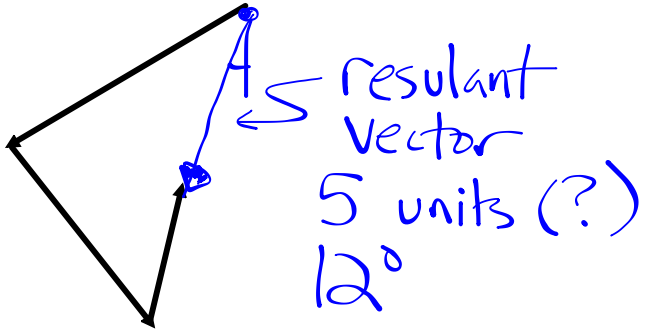
Vector Addition:



8.24, 14 degrees

4.12, 76 degrees

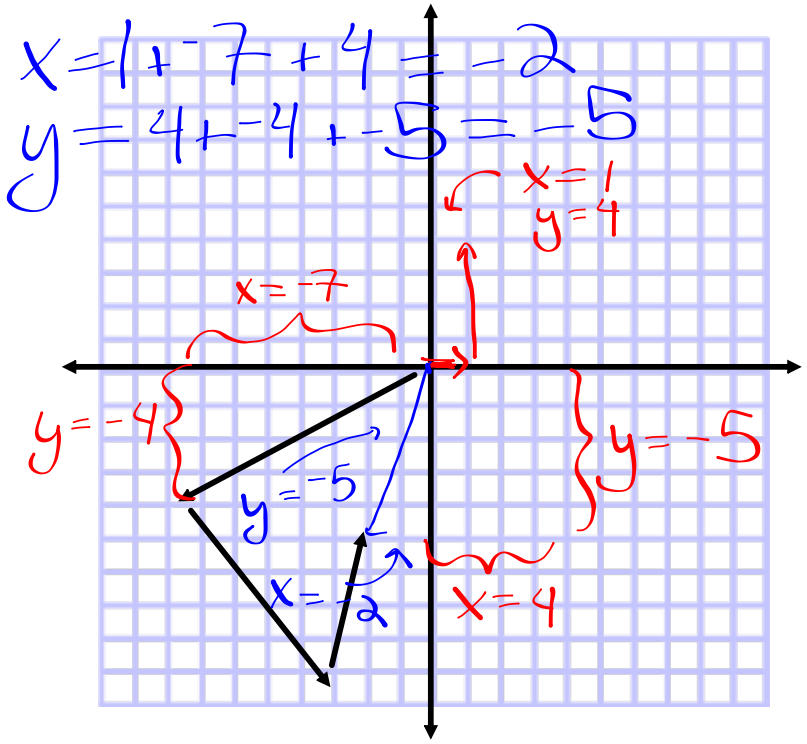
6.08, 170.5 degrees

8.06, 209.7 degrees

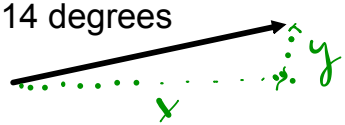
6.4, 308.7 degrees

4.12, 346 degrees

Vector Addition:



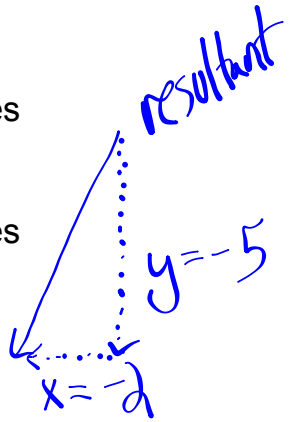
8.24, 14 degrees



4.12, 76 degrees

6.08, 170.5 degrees

8.06, 209.7 degrees



6.4, 308.7 degrees

4.12, 346 degrees

$\theta = ? = 270° - 21.8° = 248.2$

resultant

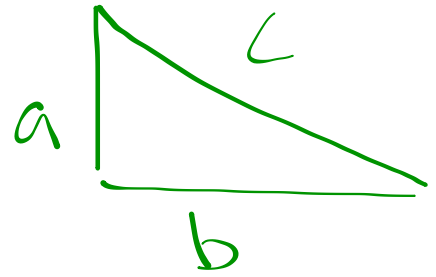
$\sqrt{(-2)^2 + (-5)^2}$

≈ 5.4

$21.8°$

$y = -5$

$x = -2$



$a^2 + b^2 = c^2$

$c = \sqrt{a^2 + b^2}$

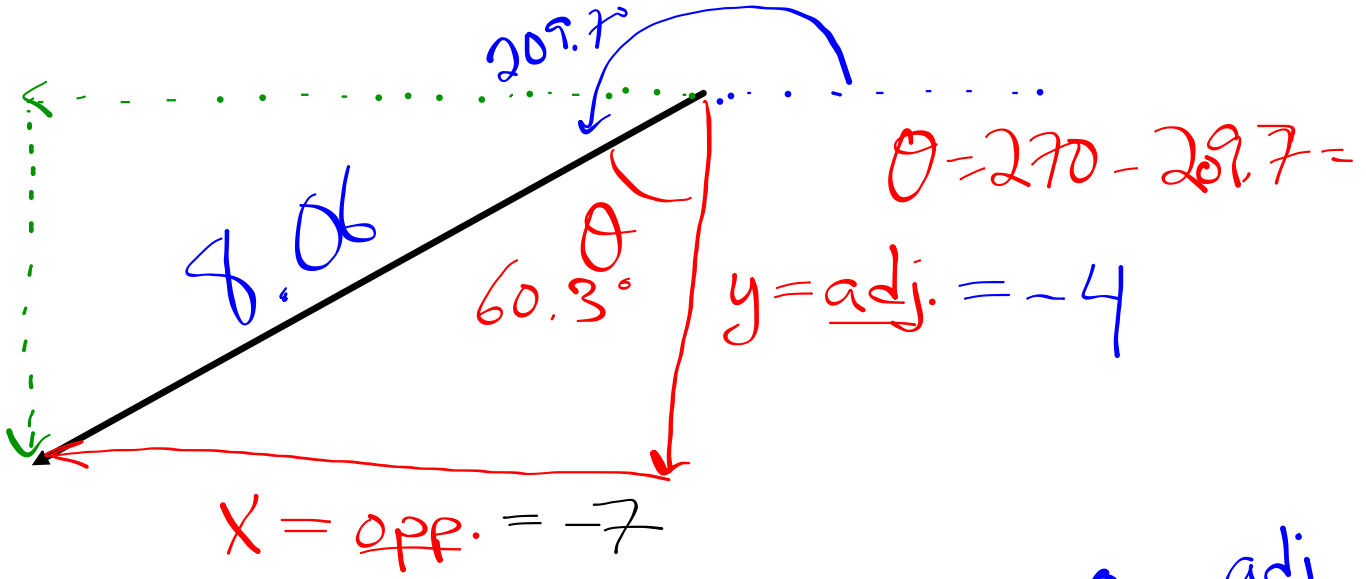
$\tan\theta = \frac{opp}{adj}$

$\tan^{-1}\frac{opp}{adj} = \theta$

$\tan^{-1}\frac{-2}{-5} = 21.8°$

length: 5.4 units

$\theta = 248.2°$



$\sin\theta = \frac{opp}{hyp}$

$\sin 60.3 = \frac{x}{8.06}$

$x = 7$

$\cos\theta = \frac{adj}{hyp}$

$\cos 60.3 = \frac{y}{8.06}$

$y = 4$

EXAMPLE 1: A bionic bunny bounces along a trail and travels 56 meters 18° west of due north. It spies a hawk, gets scared, and bolts in a direction that is 39° west of due south. Unfortunately, after going 35 meters he encounters a burly bear. For the bionic bouncing bunny to avoid the burly bear, the bouncing bunny darts away in a direction of 27° north of due east and runs for 98 meters. Where does the bunny end up relative to its starting point?

- Draw vectors as triangles on standard x-y coordinate system
- Calculate x, y components of each vector
- Combine all x & y components (addition)
- Find magnitude & angle of resultant

EXAMPLE 1: A bionic bunny bounces along a trail and travels 56 meters 18^{o} west of due north. It spies a hawk, gets scared, and bolts in a direction that is 39^{o} west of due south. Unfortunately, after going 35 meters he encounters a burly bear. For the bionic bouncing bunny to avoid the burly bear, the bouncing bunny darts away in a direction of 27^{o} north of due east and runs for 98 meters. Where does the bunny end up relative to its starting point?

EXAMPLE 2: A micro meteor experiences the simultaneous accelerations of three different stars as shown. What is the meteor's net acceleration?