

6. A car traveling at 24.5 m/s runs over a cliff and lands 8 m away from the base. How high is the cliff?

V_i	24.5	0
V_f		
a	0	10
d	8	
t		

$x = v_i t$
 $8m = (24.5m/s)(t)$
 $t = .33s$

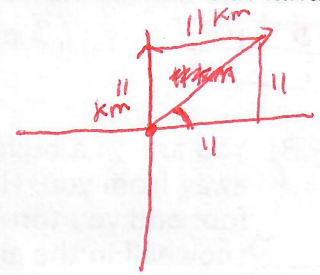
$y = \frac{1}{2} a t^2$
 $y = \frac{1}{2} (10m/s^2)(.33s)^2$
 $y = 0.55m$

7.
 $x = v_i t$
 $x = (6.2m/s)(1.1s)$
 $x = 6.82m$
 $y = \frac{1}{2} a t^2$
 $y = \frac{1}{2} (10m/s^2)(1.1s)^2$
 $y = 6.05m$

7. You set your Mt. Dew on top of your car. As you drive around a corner it is horizontally launched off the car. The can leaves the car with an initial velocity of 6.2 m/s. If the car is in the air for 1.1 second how tall is the roof of your car? How far from your car will the can land?

Vector Practice Problems (Draw vector diagrams to solve each problem.)

1) After walking 11 km due north from camp, a hiker then walks 11 km due east.

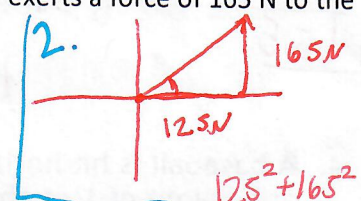


a) What is the total distance walked by the hiker?
 22 km

b) Determine the total displacement from the starting point.

$a^2 + b^2 = c^2$ $11^2 + 11^2 = c^2$
 $c = \sqrt{242}$ $c = 15.56 km$
 $\tan \theta = \frac{11 km N}{11 km E}$ $\tan^{-1}(\frac{11}{11})$ $\theta = 45^\circ$

2) Two boys push on a box. One pushes with a force of 125 N to the east. The other exerts a force of 165 N to the north. What is the size and direction of the resultant force on the box?



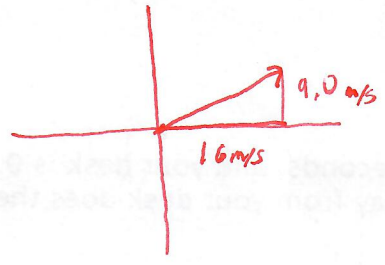
3) An explorer walks 13 km due east, then 18 km north.

A) What is the total distance walked?
 31 km

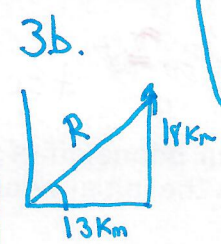
b) What is the resulting displacement of the explorer from the starting point and angle?

$125^2 + 165^2$
 $\sqrt{42850} = R$
 $R = 207 N NE$

4) A motorboat heads due east at 16 m/s across a river that flows due north at 9.0 m/s.



$16^2 + 9^2 = R^2$
 $R = 18.36 m/s$
 $\tan \theta = \frac{9}{16}$
 $\tan^{-1}(\frac{9}{16}) = \theta$
 $\theta = 29.36^\circ NE$



3b.
 $R = \sqrt{18^2 + 13^2} =$
 $\sqrt{324 + 169} =$
 $R = 22 km$
 $\tan \theta = \frac{18}{13}$
 $\theta = \tan^{-1}(\frac{18}{13})$
 $\theta = 6.68^\circ NE$