

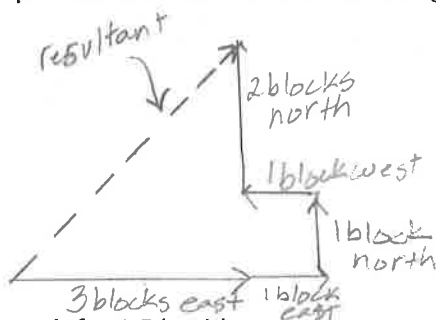
Answer Key

Physics Practice Problems for Test 2

1. A bicycle courier accepts a package and bikes 3 blocks east to the intersection of the street shown on the address label. Encountering road construction, the courier detours by continuing one block east, one block north, and one block west. The courier then bikes two blocks north to the address. What is the resultant displacement of the courier? Use the graphical method.

1 Block = 1 cm

resultant displacement you can measure to find this or you can use the pythagorean theorem to solve



measurement = 4.3 cm
 pythagorean theorem
 $3^2 + 3^2 = c^2$
 $18 = c^2$
 $\sqrt{18} = c$
 $c = 4.24$
 4.2 cm

2. A hiker travels south along a straight path for 1.5 h with an average speed of 0.75 km/h and then travels north for 2.5 h with an average speed of 0.90 km/h. What is the hiker's displacement for the total trip?

Given:

$V_{avg1} = 0.75 \text{ km/h}$

$\Delta t_1 = 1.5 \text{ h}$

(1.5 hour trip south)

$V_{avg2} = 0.90 \text{ km/h}$

$\Delta t_2 = 2.5 \text{ h}$

(2.5 hour trip north)

$\Delta x_1 = (1.5 \text{ h})(0.75 \text{ km/h})$

$\Delta x_1 = 1.125 \text{ km south}$

$\Delta x_2 = (2.5 \text{ h})(0.90 \text{ km/h})$

$\Delta x_2 = 2.25 \text{ km north}$

$\Delta x = \Delta x_1 + \Delta x_2$

$V_{avg} = \frac{\Delta x}{\Delta t}$

$\Delta t = V_{avg} = \Delta x$

$\Delta x = 2.25 - 1.125$

$\Delta x = 1.125 \text{ km}$

3. A boat moves at 10.0 m/s relative to the water. If the boat is in a river where the current is 2.00 m/s, how long does it take the boat to make a complete round trip of 1000.0m upstream?

$V_{boat} = V_{boat \text{ in river}} + V_{river}$

$V_{boat} = 10.0 \text{ m/s} + 2.00 \text{ m/s}$

$V_{boat} = 12.00 \text{ m/s}$

Given: $V_{river} = 2.00 \text{ m/s}$

$V_{boat \text{ in river}} = 10.0 \text{ m/s}$

$\Delta x = 1000.0 \text{ m}$

$V_{boat} = \frac{\Delta x}{\Delta t}$

Solve for Δt

$\Delta t = \frac{\Delta x}{V_{boat}}$

$\Delta t = \frac{1000.0 \text{ m}}{12.00 \text{ m/s}}$

$\Delta t = 83.3 \text{ s}$

4. Vector A is 3.2m in length and points along the positive y-axis. Vector B is 4.6 m in length and points along a direction 195 degrees. What is the magnitude of the resultant when vectors A and B are added? Draw the resultant.

1 m = 1 cm

