PHYSICS

ACCELERATION IN 2D

Recall: In order to calculate Acceleration ...

$$\boxed{\vec{a} = \frac{\vec{v}_2 - \vec{v}_1}{t}}$$

Using this formula we can calculate acceleration when the velocities are in multiple directions. All one has to do is to find the ***resultant velocity*** and divide it by the amount of time that passes.

To this point, we have only ***ADDED*** vectors, In the formula above, vectors are being ***SUBTRACTED***. To avoid the subtraction and convert back to an addition question we will ...

Ex: What is the opposite vector to: 80 km/h [N 30^{o} E]?

PHYSICS

ACCELERATION IN 2D

A bus moving at 80 km/h [N30°E] goes around a gentle curve and 30.0s later, he is moving at 80 km/h [E]. Find acceleration in km/h/s.

PHYSICS

ACCELERATION IN 2D

Homework

25. A car with a velocity of 25 m/s [E] changes its velocity to 25 m/s [S] in 15 s. Calculate the car's average acceleration.

26. A watercraft with an initial velocity of 6.4 m/s [E] undergoes an average acceleration of 2.0 m/s^2 [S] for 2.5 s. What is the final velocity of the watercraft?

27. A hockey puck rebounds from a board as shown in **Figure 16**. The puck is in contact with the board for 2.5 ms. Determine the average acceleration of the puck over the interval.

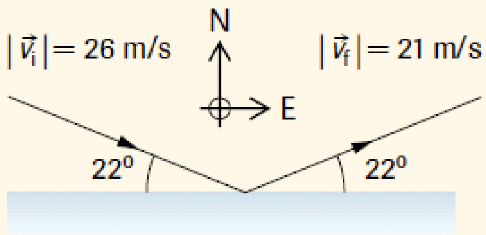

Figure 16
Motion of the puck

28. A passenger in a hot-air balloon throws a ball with an initial unknown velocity. The ball accelerates at 9.8 m/s^2 [down] for 2.0 s, at which time its instantaneous velocity is 24 m/s [45° below the horizontal]. Determine the ball's initial velocity.

Answers

25. 2.4 m/s^2 [45° S of W]
26. 8.1 m/s [38° S of E]
27. 7.3×10^3 m/s^2 [7.5° N of W]
28. 17 m/s [10° above the horizontal]