Homework 3   **PHYS 211**   **Dr. Amir**

Chap.2

51. A baseball is hit almost straight up into the air with a speed of about 20 m / s. (*a*) how high
does it go? (*b*) How long is it in the air?

63. A toy rocket moving vertically upward passes by a 2.0-m-high window whose sill is 8.0 m
above the ground. The rocket takes 0.15 s to travel the 2.0 m height of the window. What
was the launch speed of the rocket, and how high will it go? Assume the propellant is
burned very quickly at blastoff.

67. Given $v(t) = 25 + 18t$ where v is in m / s and t is in s, use calculus to determine the total
displacement from $t_1 = 1.5$ s to $t_2 = 3.1$ s.

Chap.3

3. If $V_x = 7.80$ units and $V_y = 2\ 6.40$ units, determine the magnitude and direction of $\vec{V}$.

5. $\vec{V}$ is a vector 24.8 units in magnitude and points at an angle of 23.4° above the negative x
axis. (*a*) Sketch this vector. (*b*) Calculate V_x and V_y. (*c*) Use V_x and V_y to obtain (again)
the magnitude and direction of $\vec{V}$. [*Note*: Part (*c*) is a good way to check if you've resolved
your vector correctly.]

10. Three vectors are shown in Fig. 3–38. Their magnitudes are given in arbitrary units.
Determine the sum of the three vectors. Give the resultant in terms of (*a*) components, (*b*)
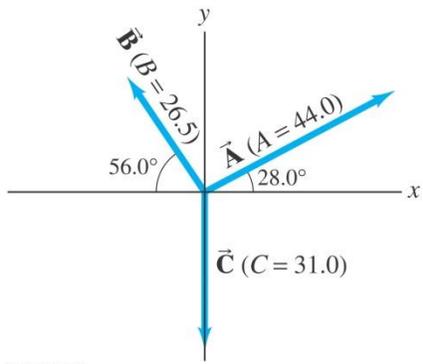magnitude and angle with x axis.

Fig. 3–38

38. A baseball is hit with a speed of 27.0 m / s at an angle of 45.0°. It lands on the flat roof of a 13.0-m-tall nearby building. If the ball was hit when it was 1.0 m above the ground, what horizontal distance does it travel before it lands on the building?

46. A projectile is shot from the edge of a cliff 115 m above ground level with an initial speed of 65.0 m / s at an angle of 35.0° with the horizontal, as shown in Fig. 3–44. (*a*) Determine the time taken by the projectile to hit point P at ground level. (*b*) Determine the distance X of point P from the base of the vertical cliff. At the instant just before the projectile hits point P, find (*c*) the horizontal and the vertical components of its velocity, (*d*) the magnitude of the velocity, and (*e*) the angle made by the velocity vector with the horizontal. (f) Find the maximum height above the cliff top reached by the projectile.
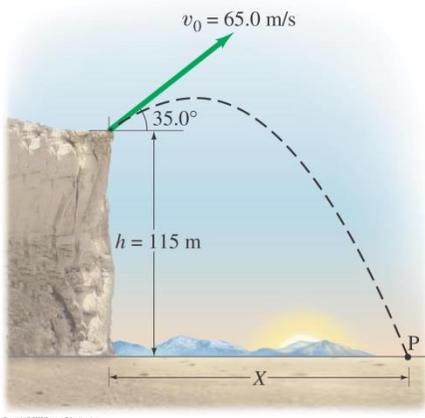

Fig. 3–44