

22. If we wish to use Eq. 3-5 in an unmodified fashion, we should note that the angle between  $\vec{C}$  and the  $+x$  axis is  $180^\circ + 20^\circ = 200^\circ$ .

- (a) The  $x$  component of  $\vec{B}$  is given by  $C_x - A_x = 15 \cos 200^\circ - 12 \cos 40^\circ = -23.3$  m, and the  $y$  component of  $\vec{B}$  is given by  $C_y - A_y = 15 \sin 200^\circ - 12 \sin 40^\circ = -12.8$  m. Consequently, its magnitude is  $\sqrt{(-23.3)^2 + (-12.8)^2} = 26.6$  m.
- (b) The two possibilities presented by a simple calculation for the angle between  $\vec{B}$  and the  $+x$  axis are  $\tan^{-1}((-12.8)/(-23.3)) = 28.9^\circ$ , and  $180^\circ + 28.9^\circ = 209^\circ$ . We choose the latter possibility as the correct one since it indicates that  $\vec{B}$  is in the third quadrant (indicated by the signs of its components). We note, too, that the answer can be equivalently stated as  $-151^\circ$ .