Problem 7-30

$$v_{0x} = 39.0 \cos 50.0° = 25.0_7 \text{ m/s}$$

$$v_{0y} = 39.0 \sin 50.0° = 29.8_8 \text{ m/s}$$

$$a_x = 0$$

$$a_y = -9.80 \text{ m/s}^2$$

$$y = y_0 + v_{0y} t + \tfrac{1}{2} a_y t^2$$

$$\therefore 0 = 0 + 29.8_8 t - 4.90 t^2$$

$$\therefore t = \frac{29.8_8}{4.90} = 6.09_7 \text{ s}$$

$$x = x_0 + v_{0x} t$$

$$= 0 + (25.0_7)(6.09_7)$$

$$= 152.9 \text{ m}$$

$\therefore$ the fielder must run $(152.9 - 125) = 27.9$ m in 6.09_7 s to catch the ball

$$\therefore \text{his speed} = \frac{27.9 \text{ m}}{6.09_7 \text{ s}} = 4.6 \text{ m/s}$$