54. (a) With SI units (and three significant figures) understood, the object's displacement is

$$\vec{d} = \vec{d}_f - \vec{d}_i = -8\,\hat{\mathrm{i}} + 6\,\hat{\mathrm{j}} + 2\,\hat{\mathrm{k}} \ .$$

Thus, Eq. 7-8 gives

$$W = \vec{F} \cdot \vec{d} = (3)(-8) + (7)(6) + (7)(2) = 32.0 \text{ J} \ .$$

(b) The average power is given by Eq. 7-42:

$$P_{\text{avg}} = \frac{W}{t} = \frac{32}{4} = 8.00 \text{ W} \ .$$

(c) The distance from the coordinate origin to the initial position is $d_i = \sqrt{3^2 + (-2)^2 + 5^2} = 6.16$ m, and the magnitude of the distance from the coordinate origin to the final position is $d_f = \sqrt{(-5)^2 + 4^2 + 7^2} = 9.49$ m. Their scalar (dot) product is

$$\vec{d}_i \cdot \vec{d}_f = (3)(-5) + (-2)(4) + (5)(7) = 12.0 \text{ m}^2 \ .$$

Thus, the angle between the two vectors is

$$\phi = \cos^{-1}\left(\frac{\vec{d}_i \cdot \vec{d}_f}{d_i\, d_f}\right) = \cos^{-1}\left(\frac{12.0}{(6.16)(9.49)}\right)$$

which yields $\phi = 78°$.