10. We use Eq. 4-15 with $\vec{v}_1$ designating the initial velocity and $\vec{v}_2$ designating the later one.

(a) The average acceleration during the $\Delta t = 4$ s interval is

$$\vec{a}_{\text{avg}} = \frac{\left(-2\,\hat{\text{i}} - 2\,\hat{\text{j}} + 5\,\hat{\text{k}}\right) - \left(4\,\hat{\text{i}} - 22\,\hat{\text{j}} + 3\,\hat{\text{k}}\right)}{4} = -1.5\,\hat{\text{i}} + 0.5\,\hat{\text{k}}$$

in SI units (m/s^2).

(b) The magnitude of $\vec{a}_{\text{avg}}$ is $\sqrt{(-1.5)^2 + 0.5^2} = 1.6$ m/s^2. Its angle in the xz plane (measured from the $+x$ axis) is one of these possibilities:

$$\tan^{-1}\left(\frac{0.5}{-1.5}\right) = -18^\circ \quad \text{or} \quad 162^\circ$$

where we settle on the second choice since the signs of its components imply that it is in the second quadrant.