1. A particle travels at constant velocity on the time intervals $[0, 6]$ and $(6, 12]$. It is at $(2, 1)$ at time 4, at $(-1, 3)$ at 6, and $(5, 4)$ at time 12. Write an equation that describes the position of the particle at time t and determine the position of the particle at time 0.

2. A particle rotates counterclockwise around the point $(3, 2)$ at constant speed of 4. It is at the point $(6, 2)$ at time 0. Write an equation that models the position of the particle at time t.

3. Take A to be a particle that moves on the line segment with endpoints $(1, 2)$ and $(5, 7)$. It is at $(1, 2)$ at time 0 and it moves along the line segment at a speed of 2. Take B to be a particle that rotates around A in a counterclockwise direction as A travels. It is a distance of 3 to the right of A at time 0 and has a speed of 14.

a Write down equations that model the motion for A and B.

b Determine how long it takes for A to reach $(5, 7)$.

c Determine how many full orbits B has made by the time A reaches $(5, 7)$.

4. A rectangle R has vertices at $(2, 3)$, $(3, 5)$, $(-1, 7)$, and $(-2, 5)$. Determine a rigid transformation so that the vertex of R at $(2, 3)$ is at $(0, 0)$ and the edge $\overline{(2, 3)(3, 5)}$ is on the x-axis. Then determine the positions of vertices after applying this transformation.