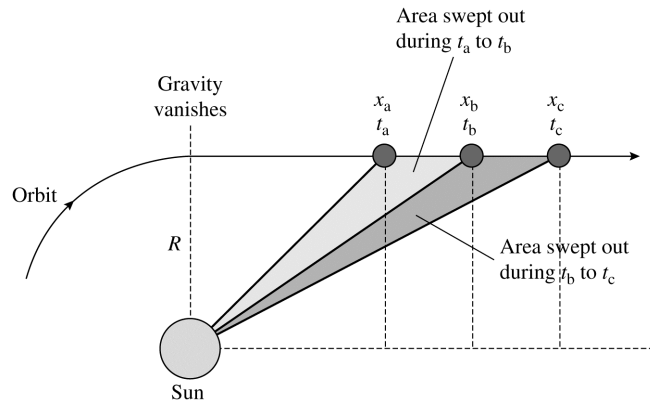


12.67. Visualize:



Solve: We choose two equal time intervals $t_b - t_a$ and $t_c - t_b$. A constant velocity and equal time intervals means that $x_b - x_a = x_c - x_b$. The area swept from $t = 0$ s to $t = t_a$ is $Rx_a/2$ and the area swept from $t = 0$ s to $t = t_b$ is $Rx_b/2$. Thus, the area swept between $t = t_a$ and $t = t_b$ is $R(x_b - x_a)/2$. In the same way, the area swept between $t = t_b$ and $t = t_c$ is $R(x_c - x_b)/2$. Since $x_c - x_b = x_b - x_a$, the area swept during time $(t_b - t_a)$ is the same as the area swept during an equal time $(t_c - t_b)$. Kepler's second law is obeyed.