53. We follow the approach shown in Sample Problem 14-7. In our system, we have $m_1 = m_2 = M$ (the mass of our Sun, 1.99×10^{30} kg). From Eq. 14-37, we see that $r = 2r_1$ in this system (so r_1 is one-half the Earth-to-Sun distance r). And Eq. 14-39 gives $v = \pi r/T$ for the speed. Plugging these observations into Eq. 14-35 leads to

$$\frac{Gm_1m_2}{r^2} = m_1\frac{(\pi r/T)^2}{r/2} \implies T = \sqrt{\frac{2\pi^2 r^3}{GM}} .$$

With $r = 1.5 \times 10^{11}$ m, we obtain $T = 2.2 \times 10^7$ s. We can express this in terms of Earth-years, by setting up a ratio:

$$T = \left(\frac{T}{1\,\mathrm{y}}\right)(1\,\mathrm{y}) = \left(\frac{2.2 \times 10^7\,\mathrm{s}}{3.156 \times 10^7\,\mathrm{s}}\right)(1\,\mathrm{y}) = 0.71 \text{ y} .$$