Answer on question #64404, Physics / Mechancis | Relativity

Question What is your velocity with respect to the center of the Sun? Again, give your answer in km/s and miles per hour, and do your best to specify your direction of motion in words.

Solution The length of the orbit is

$$L = 2\pi R$$

where $R = 150 \cdot 10^6$ km is radius of the orbit

$$L = 2 \cdot 3.14 \cdot 150 \cdot 10^6 = 942 \cdot 10^6\, km$$

The time of pathing this orbit is 1 year $= 31.557 \cdot 10^6$ seconds. Hence, velocity is

$$v = \frac{L}{t} = \frac{942 \cdot 10^6}{31.557 \cdot 10^6} \approx 29.85 km/s \approx 66772.5\, miles/h$$

The direction in every moment is tangent to the orbit of the Earth.