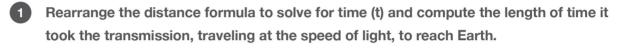
TT IN THE SKY11

ANSWER KEY



How many kilometers ahead along Earth's orbit did the team need to aim the laser?



$$D = rt \implies t = D/r$$

 $t = (30,199,000 \text{ km}) / (299,792 \text{ km/s}) \approx 101 \text{ seconds}$



$$C = 2\pi r = 2 \bullet \pi \bullet 149,000,000 \text{ km} \approx 936,194,611 \text{ km}$$

Rearrange the distance formula to solve for rate (r) and convert units to compute Earth's rate of travel in kilometers per second.

$$D = rt \implies r = D/t$$

((936,194,611 km)/(1 year))(365.24 days/1 year)(24 hours/1 day)(60 min/1 hour)(60 sec/1 min) ≈ 29.67 km/s

4 Use the distance formula once again to compute the distance Earth will have traveled during the time it took the transmission to arrive.

D = rt
$$\approx$$
 (29.67 km/s) • (101 s) \approx 3,000 km

