Where Are All of Us on Earth Heading Next?

One morning you see a third quarter moon. Sketch a stick figure pointing one arm at the

Sun and one arm at a 3rd quarter moon. About what time is this

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East S West

What if you were looking down on a third quarter moon from above the solar system?

Sketch the Earth in its orbit around the Sun and put the Moon in the third quarter position in its orbit around the Earth.

Which way is the Earth moving in its orbit?

How soon will it get to where the third quarter moon is “now”?

How soon will we get there?

To figure this out, what do we know about the physics of this situation?

What concepts, for example, are useful in describing motion? How are they related?

What two idealizations would be helpful to make in this situation?

What is the key relationship in this situation?

How is this key relationship related to the quantity we are trying to find?

How can this key relationship be stated mathematically in words? In symbols?

What is the equation (in symbols) for the unknown?

∆t =

What numerical values and relationships do we know or are told?

∆x = average distance between Earth and Moon = 238,000 miles = about 250,000 miles

∆T = duration of one trip of Earth around Sun = one year = 365.25 days = about 400 days

R = distance from Earth to Sun = 93,000,000 miles = about 100,000,000 miles

Circumference of the Earth’s orbit = 2πR

How much time does it take for the Earth to move in its orbit around the Sun from where the Earth “is” now to where the third quarter moon “is” now?

**∆t =**

Why is this a reasonable answer?