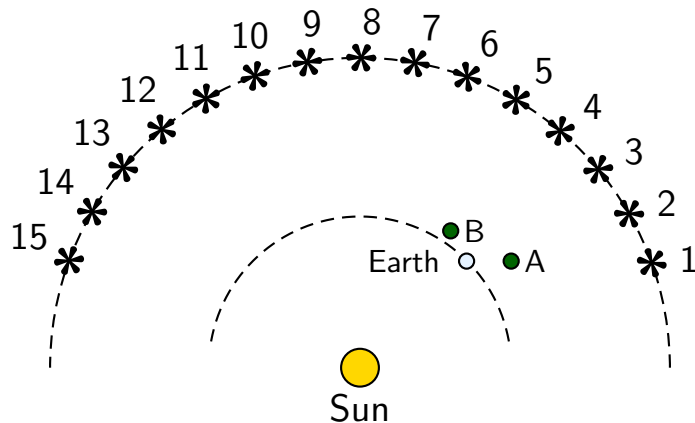


# Question 1

In the heliocentric model of the solar system, Earth orbits around the Sun in an approximate circle. A rogue spacecraft rapidly moves across the night sky. During a period when Earth barely moves, the spacecraft moves from position A to B.

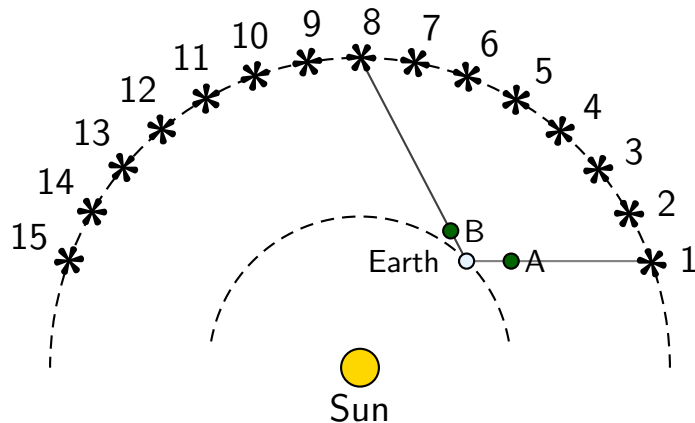


How does the apparent position of the spacecraft, against the background stars, as viewed from Earth change as it moves from A to B?

1. Appears to move from star 1 to star 2.
2. Appears to move from star 1 to star 5.
3. Appears to move from star 1 to star 8.
4. Appears to move from star 2 to star 3.
5. Appears to move from star 2 to star 5.

## Solution

In the heliocentric model of the solar system, Earth orbits around the Sun in an approximate circle. A rogue spacecraft rapidly moves across the night sky. During a period when Earth barely moves, the spacecraft moves from position A to B.

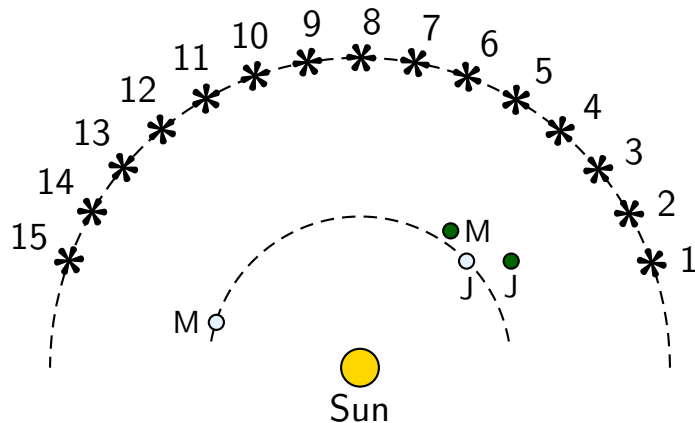


How does the apparent position of the spacecraft, against the background stars, as viewed from Earth change as it moves from A to B?

1. Appears to move from star 1 to star 2.
2. Appears to move from star 1 to star 5.
3. Appears to move from star 1 to star 8.
4. Appears to move from star 2 to star 3.
5. Appears to move from star 2 to star 5.

## Question 2

In the heliocentric model of the solar system, Earth orbits around the Sun in an approximate circle. A rogue spacecraft drifts slowly across the night sky. In January Earth and spacecraft are at locations J. In May they are at locations M.

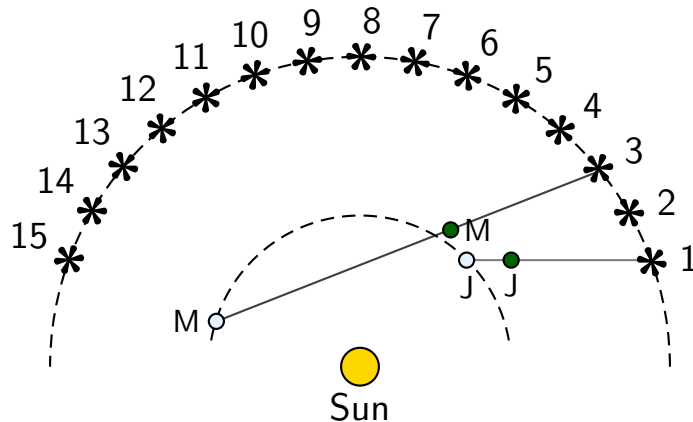


How does the apparent position of the spacecraft, against the background stars, as viewed from Earth change as it moves from January to May?

1. Appears to move from star 1 to star 2.
2. Appears to move from star 1 to star 3.
3. Appears to move from star 1 to star 4.
4. Appears to move from star 1 to star 5.
5. Appears to move from star 2 to star 5.

## Solution

In the heliocentric model of the solar system, Earth orbits around the Sun in an approximate circle. A rogue spacecraft drifts slowly across the night sky. In January Earth and spacecraft are at locations J. In May they are at locations M.



How does the apparent position of the spacecraft, against the background stars, as viewed from Earth change as it moves from January to May?

1. Appears to move from star 1 to star 2.
2. Appears to move from star 1 to star 3.
3. Appears to move from star 1 to star 4.
4. Appears to move from star 1 to star 5.
5. Appears to move from star 2 to star 5.

## Question 3

Consider Venus in two possible solar system models:

**Geocentric:** Earth at center, Venus orbits in a circle at a steady rate.

**Heliocentric:** Sun at center, Venus, Earth orbit in a circles at different steady rates.

Which of the following is true about the apparent size of Venus as observed from Earth as time passes?

1. Varies in geocentric model, stays same in heliocentric model.
2. Varies in heliocentric model, stays same in geocentric model.
3. Stays same in both models.
4. Varies in both models.