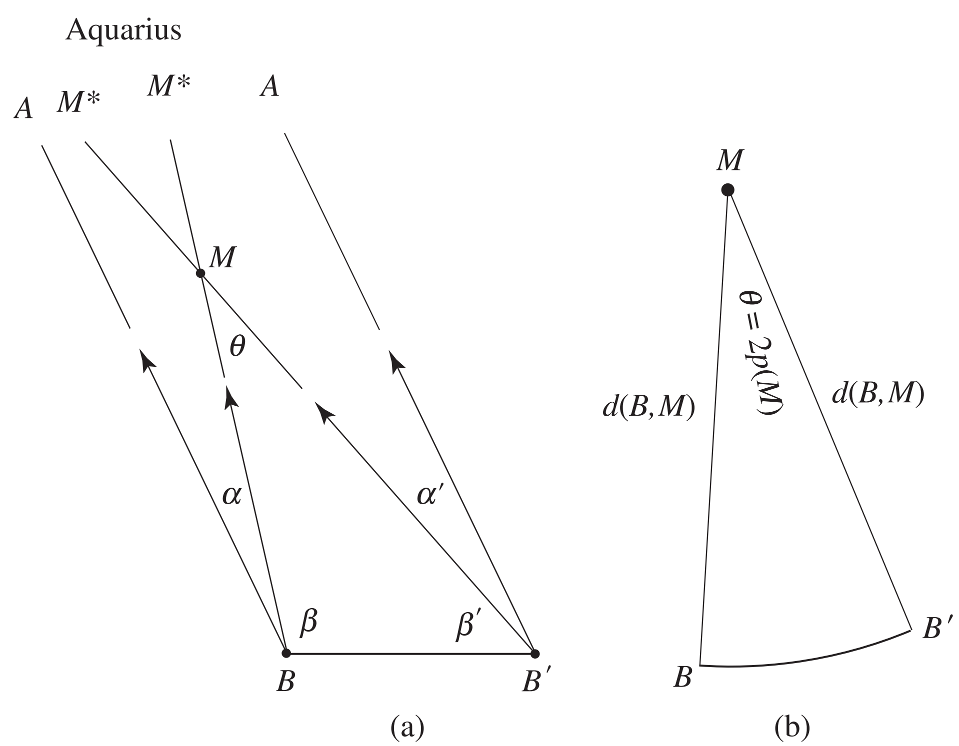
Quiz **Name**

Recall that the maximum and minimum speeds ($v_{\max}$ and $v_{\min}$, respectively) of any planet in its orbit satisfy the equality $\frac{v_{\max}}{v_{\min}} = \frac{1+\varepsilon}{1-\varepsilon}$, where ε is the eccentricity of its orbit.

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn
Semimajor Axis (in au)	0.387	0.723	1.000	1.524	5.203	9.537
Orbital Eccentricity	0.206	0.007	0.017	0.093	0.048	0.054
Orbit Period (in years)	0.241	0.615	1.000	1.881	11.863	29.447

1. The speed of a planet satisfies the condition that $v_{\max}$ is almost exactly 10% greater than $v_{\min}$. Find the ratio $\frac{v_{\max}}{v_{\min}}$ for this planet, and use this information to determine the eccentricity of its orbit. Then use the table to identify the planet.

2. The astronomer Flamsteed observed Mars from his observatory in Derby, Derbyshire, England in early October of the year 1672. On a clear night with his observatory in location B ne observed Mars in the night sky near a very distant star A in the constellation Aquarius.



A little over six hours later, after B had rotated to its new position B', he did the same thing once more. The written record of the observations he made that night contained (along with the essential numerical data) the two diagrams above. Explain the role that the two diagrams played in Flamsteed's derivation of the approximate distance from Earth to Mars (at that time and date).