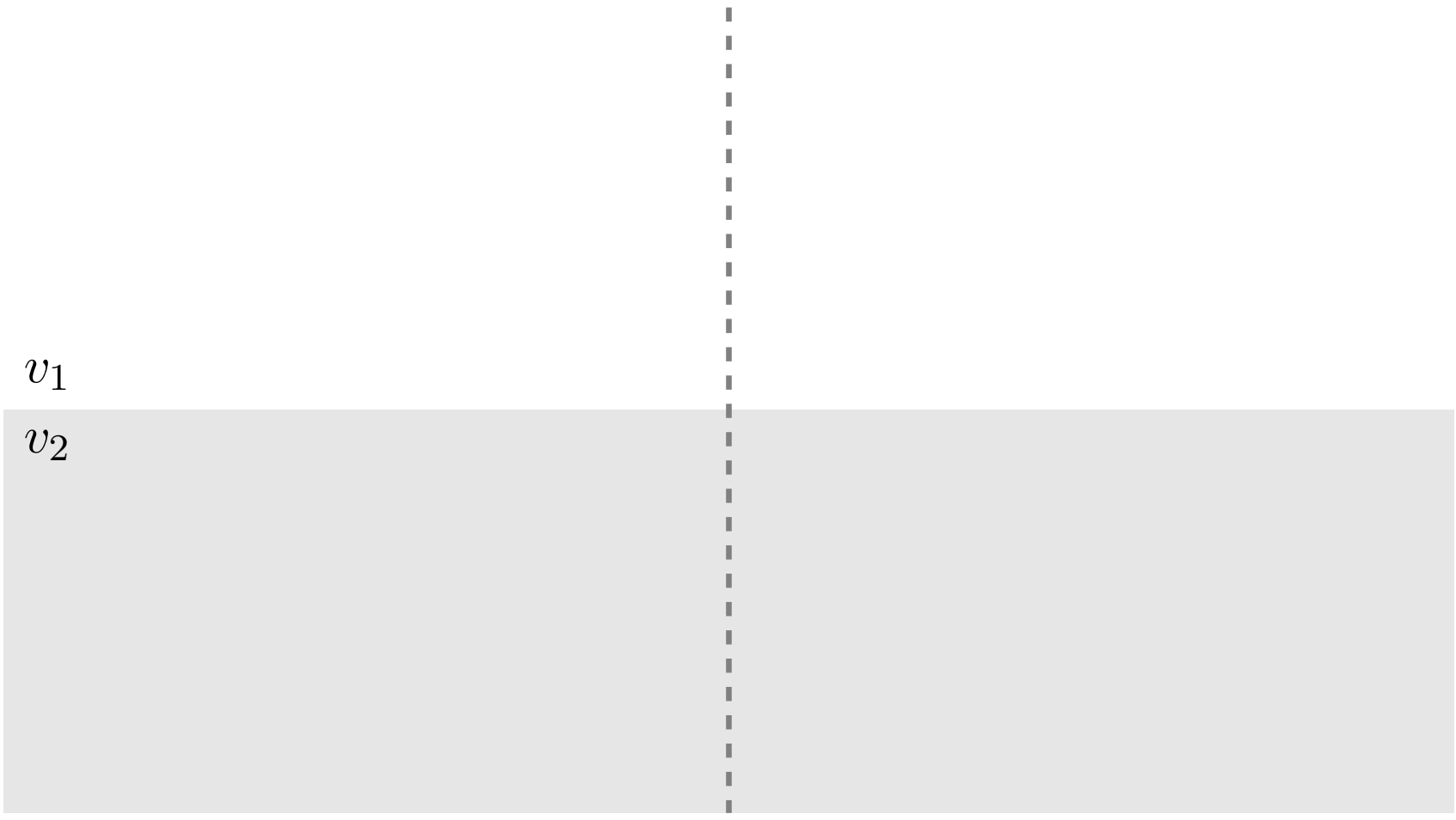
Snell's law

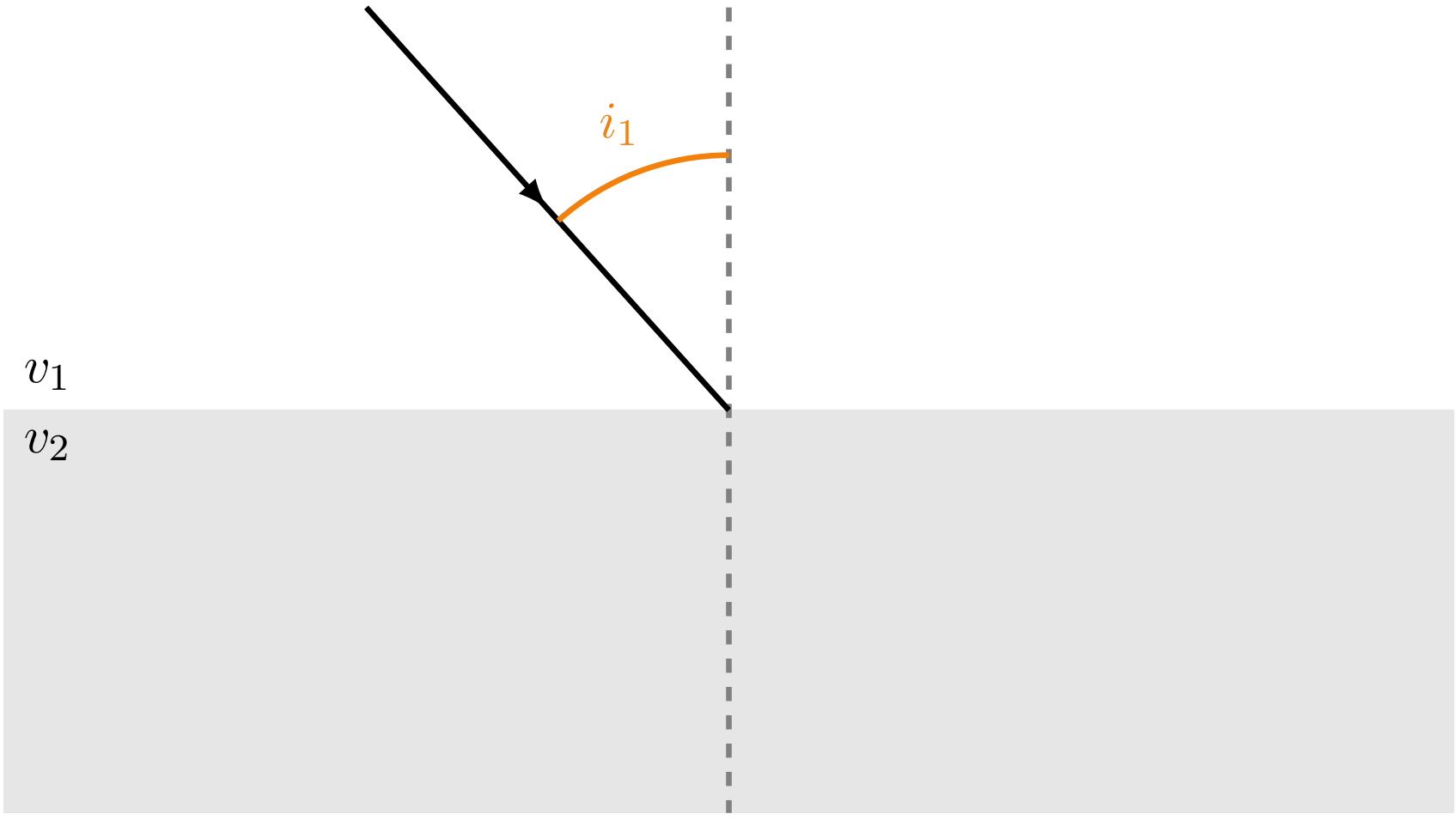
Fermat law

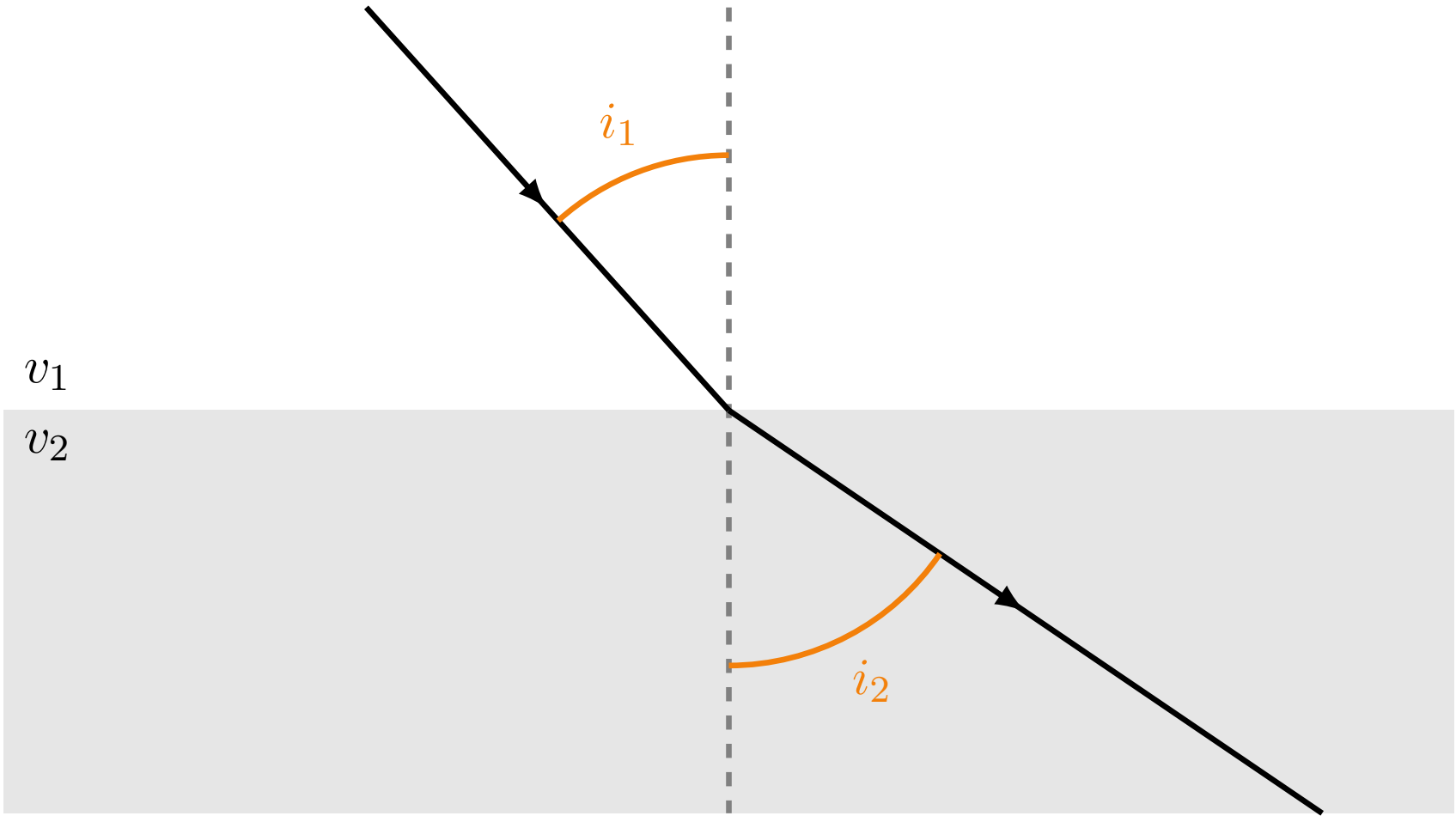
Principle of least time — path taken by a ray between two given points is the path that can be traversed in the least time.

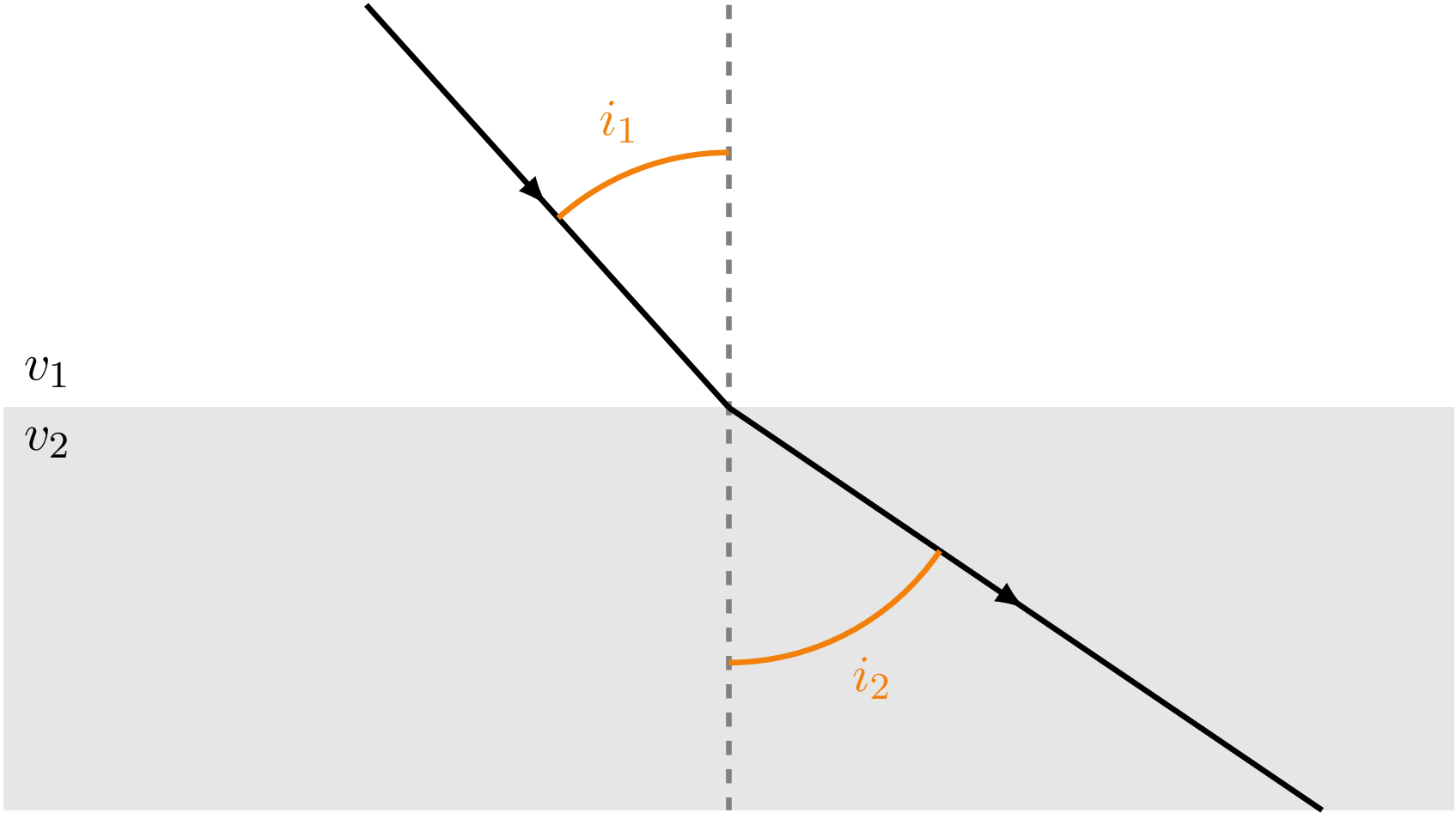
Snell's law

Snell's law (Snell–Descartes law, the law of refraction)

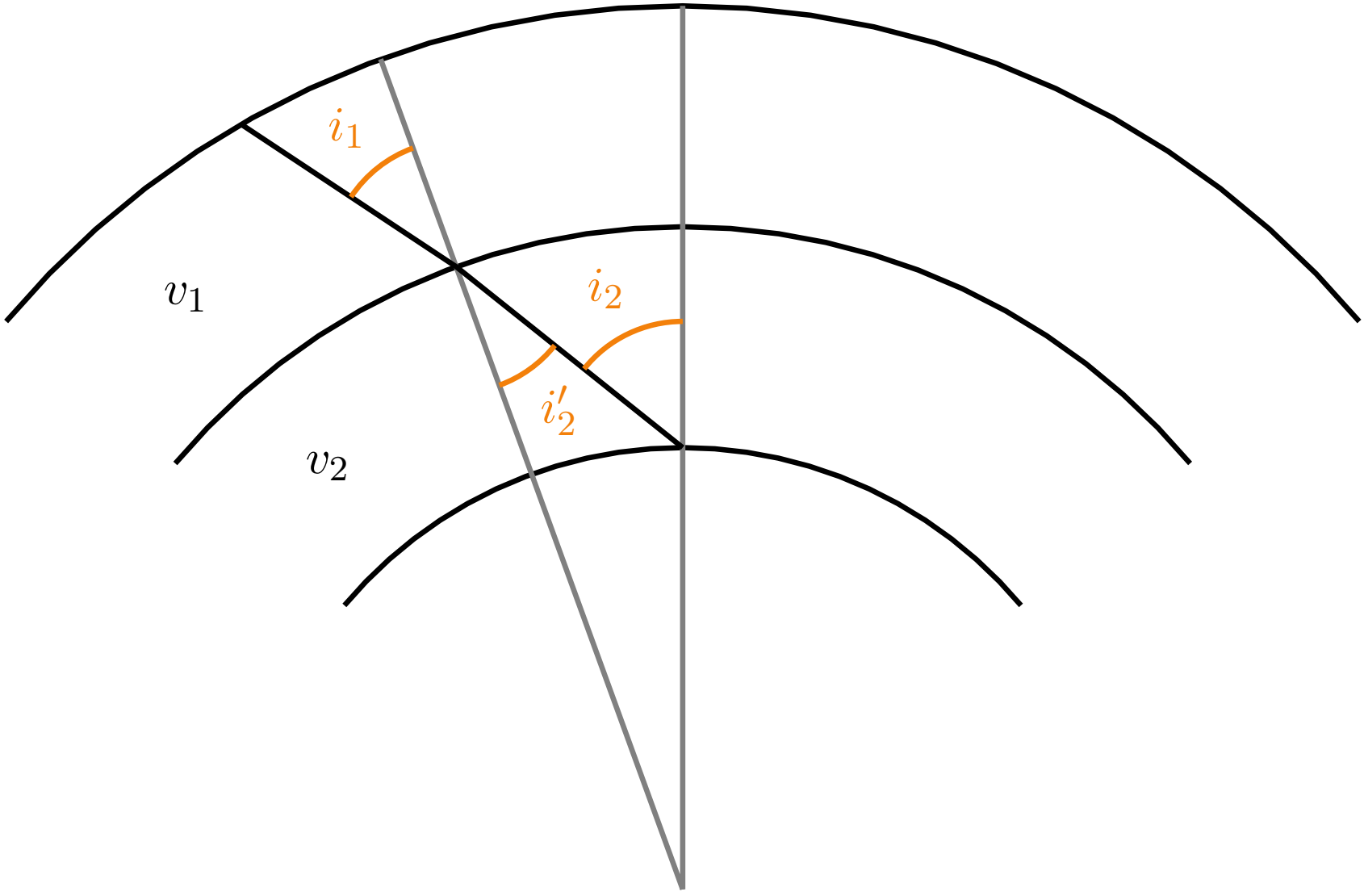

v_1
v_2

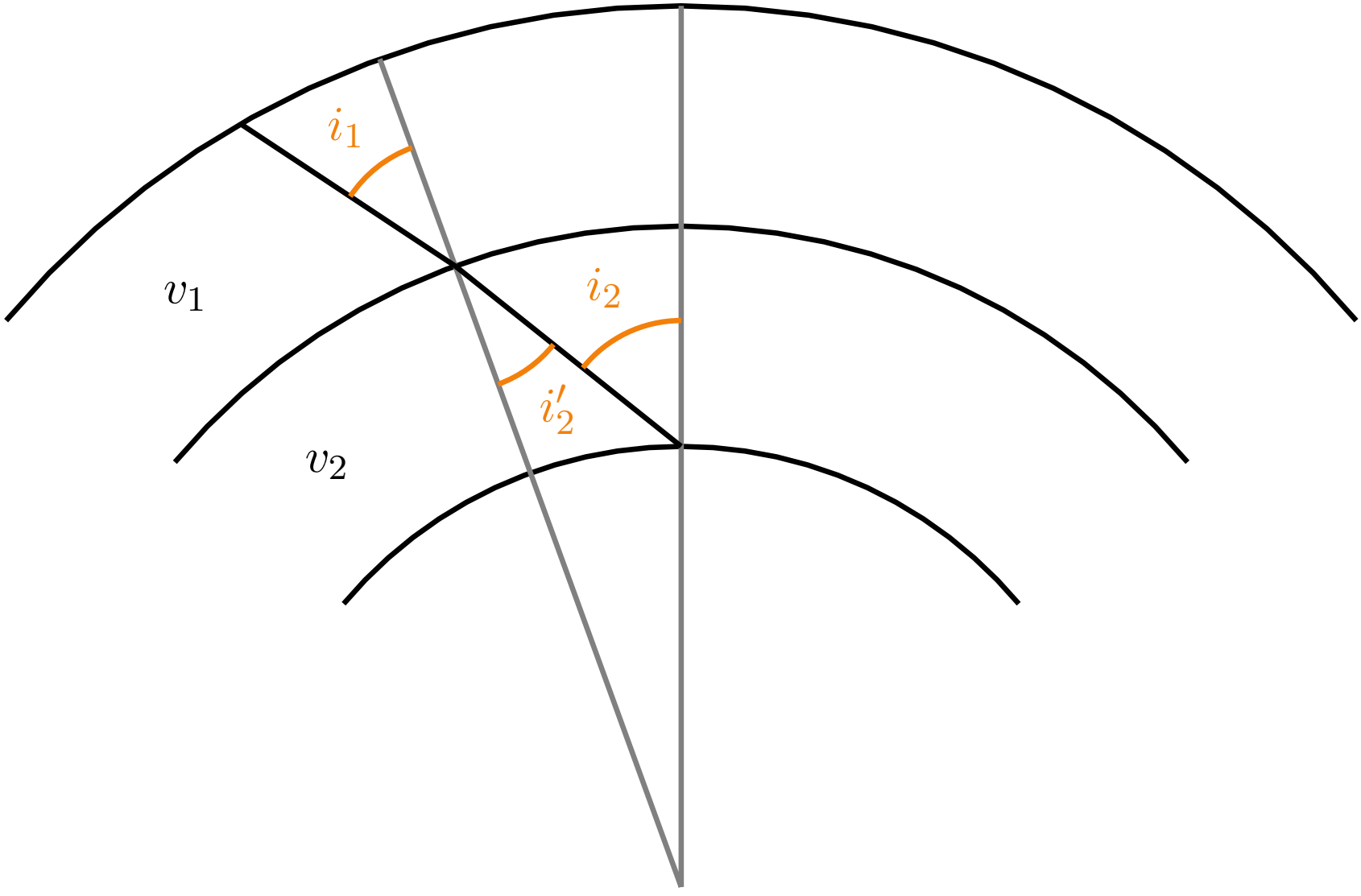

i_1
v_1
v_2


i_1
v_1
v_2
i_2

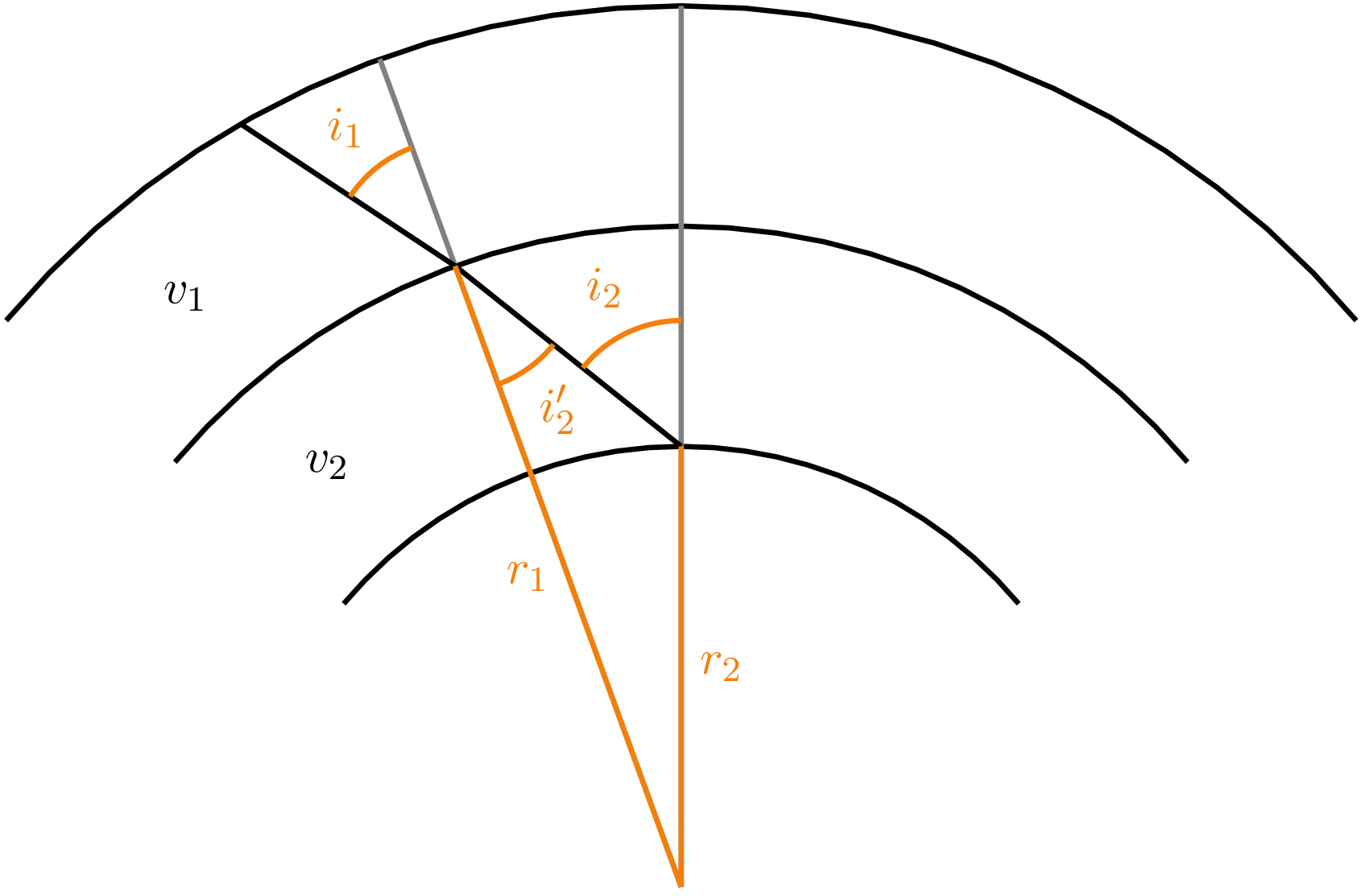


$$\frac{\sin i_1}{\sin i_2} = \frac{v_1}{v_2}$$

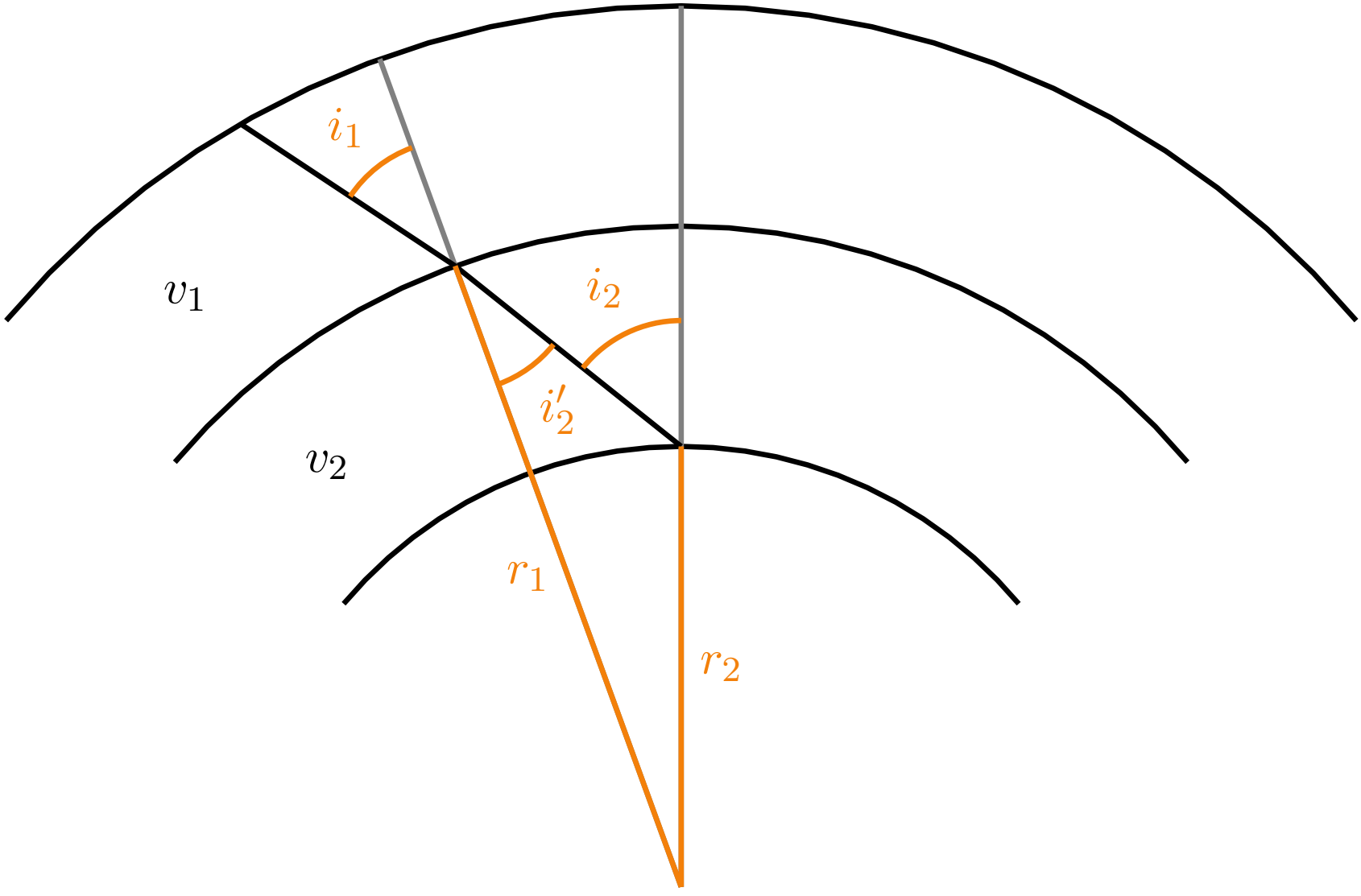

i_1
v_1
i_2
i_2'
v_2



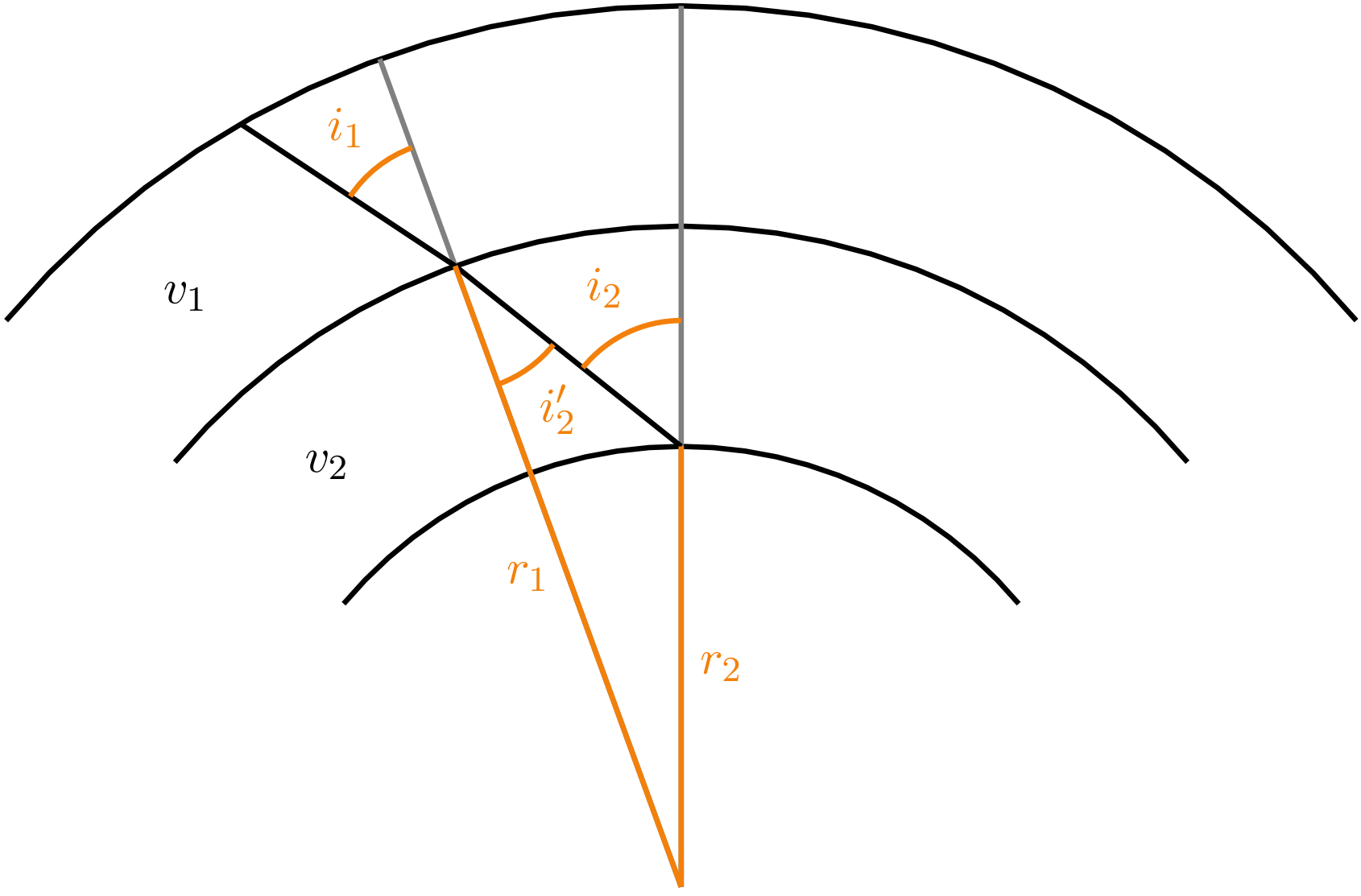
$$\frac{\sin i_1}{\sin i'_2} = \frac{v_1}{v_2};$$



$$\frac{\sin i_1}{\sin i'_2} = \frac{v_1}{v_2};$$



$$\frac{\sin i_1}{\sin i'_2} = \frac{v_1}{v_2}; \qquad \frac{\sin i_2}{\sin i'_2} = \frac{r_1}{r_2};$$



$$\frac{\sin i_1}{\sin i_2'} = \frac{v_1}{v_2}; \qquad \frac{\sin i_2}{\sin i_2'} = \frac{r_1}{r_2}; \qquad \frac{r_1 \sin i_1}{v_1} = \frac{r_2 \sin i_2}{v_2}$$

Radius equation

$$\frac{r \sin i}{v} = const$$