Experimental Physics 3 - Em-Waves,Optics, Quantum mechanics

Lecture 2
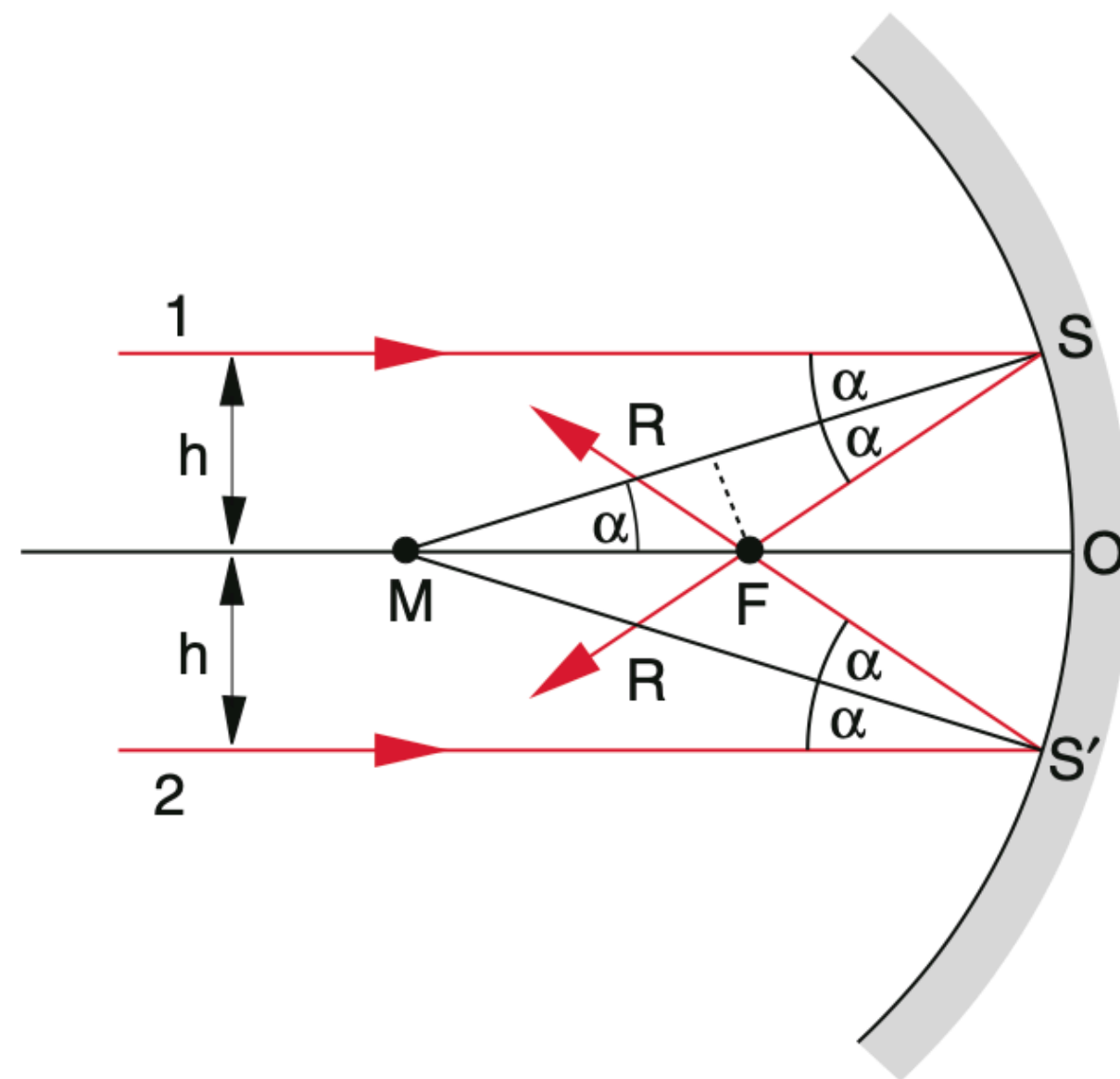
Prof. Dr. Frank Cichos
WS 2020/21

1.3 Mirrors, Prisms, Lenses - Mirrors

Plane Mirrors

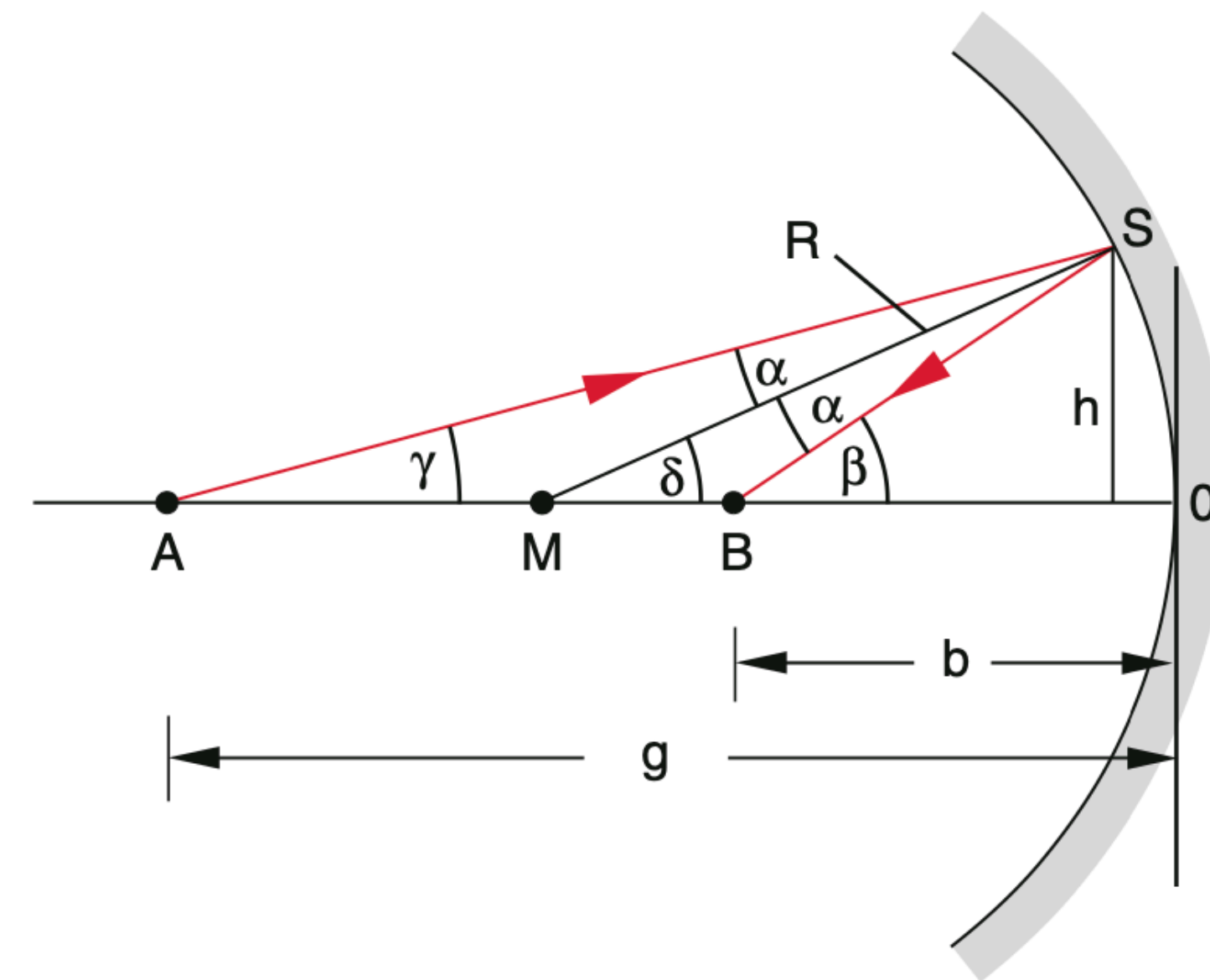# 1.3 Mirrors, Prisms, Lenses - Mirrors

Concave (spherical) Mirrors

Focal distance

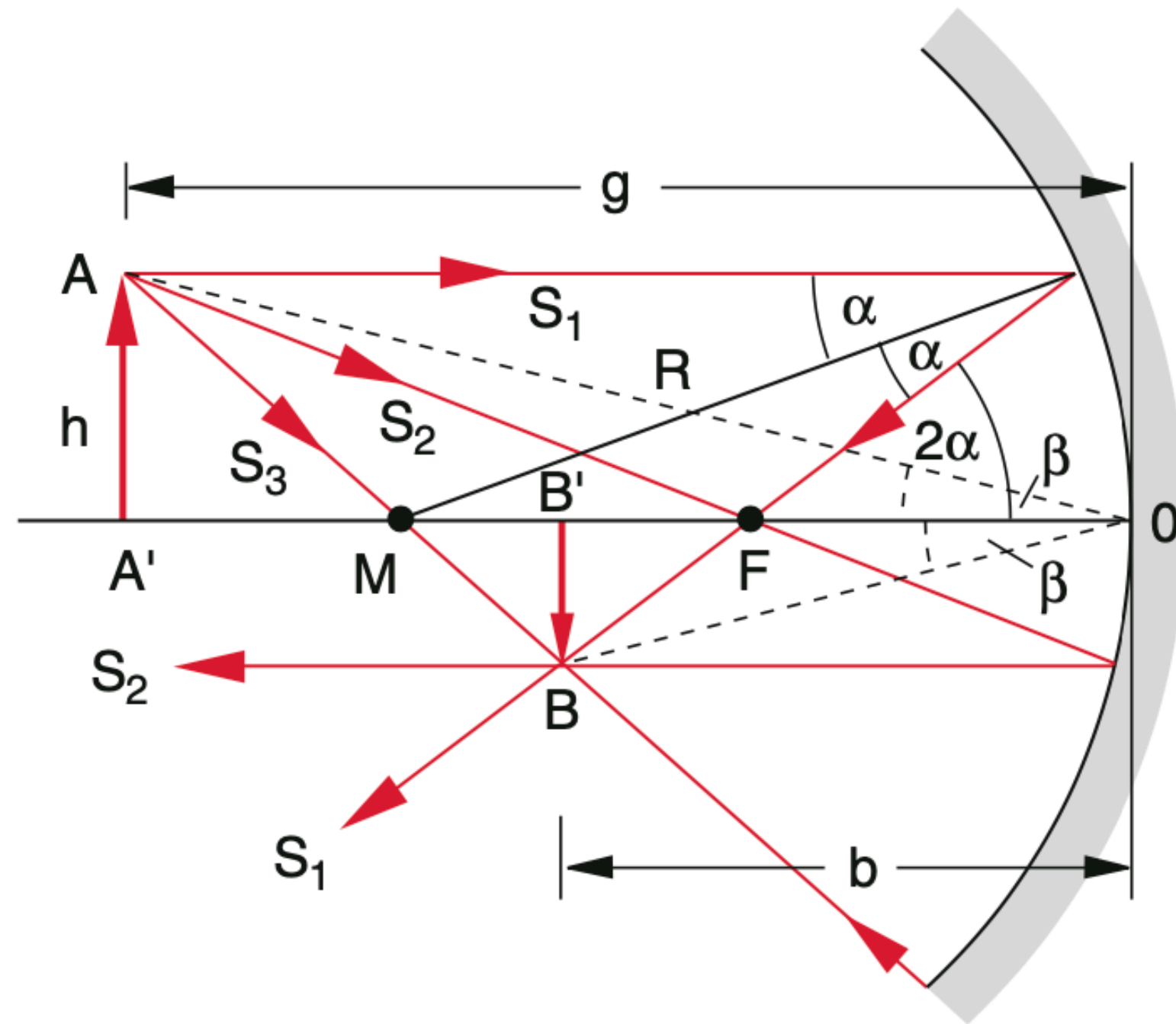$$f = OF = R(1 - 1/(2\cos(\alpha)))$$

$$f = R\left(1 - \frac{R}{2\sqrt{R^2 - h^2}}\right)$$

Imaging equation

$$\frac{1}{g} + \frac{1}{b} \approx \frac{2}{R} \approx \frac{1}{f}$$

1.3 Mirrors, Prisms, Lenses - Mirrors

$$\frac{1}{g} + \frac{1}{b} \approx \frac{2}{R} \approx \frac{1}{f}$$

$g > 2f$
- smaller real image
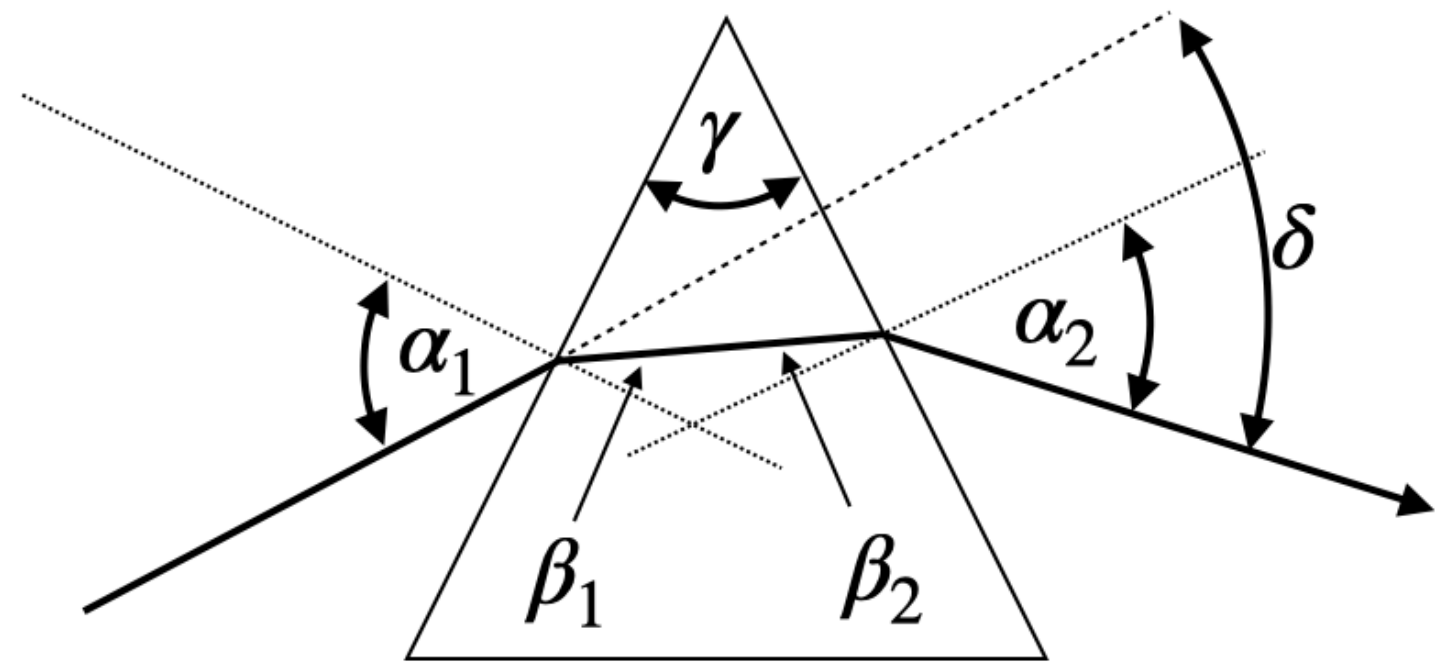- reversed image

$g = 2f$
- same sized real image
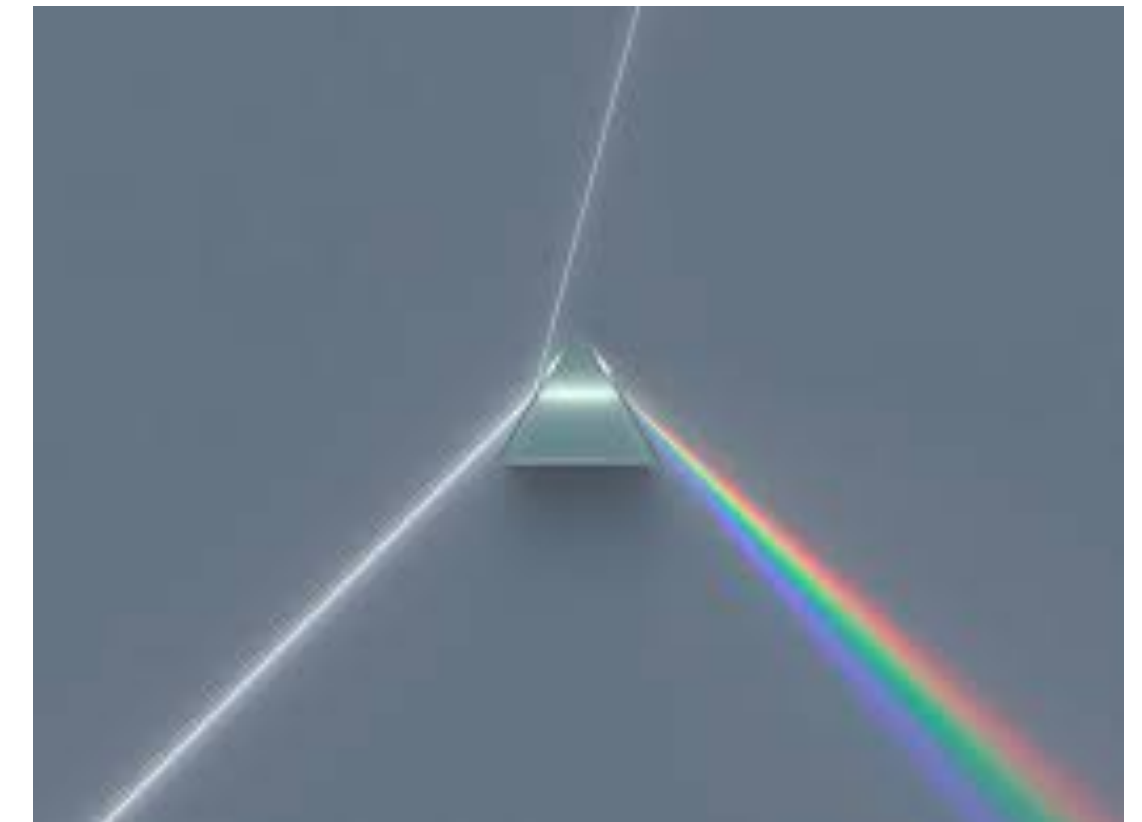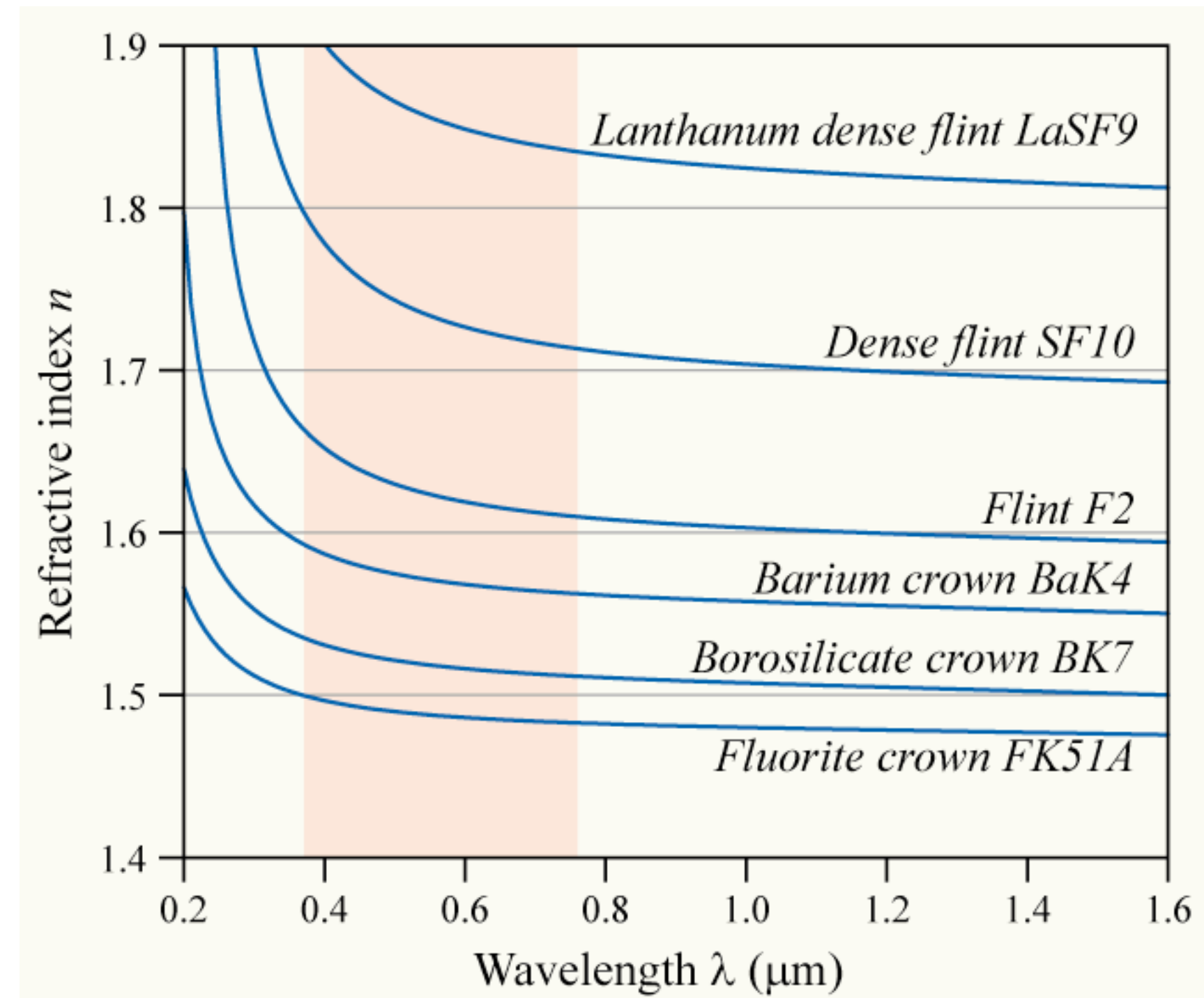- reversed image

$f < g < 2f$
- larger real image
- reversed image
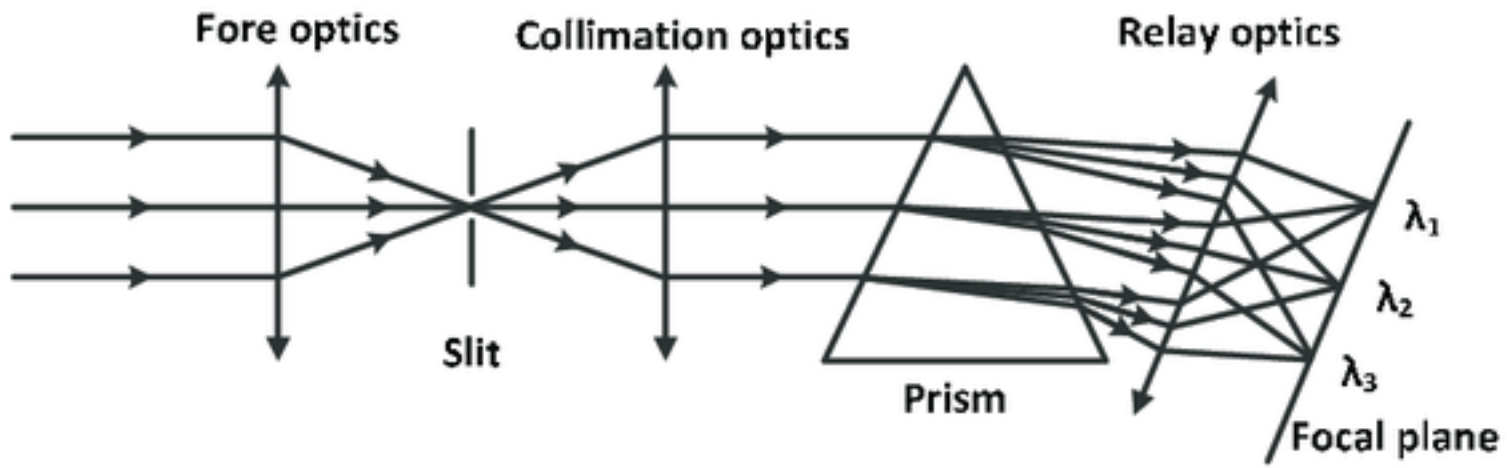
$g < f$
- larger virtual image
- orientation as object

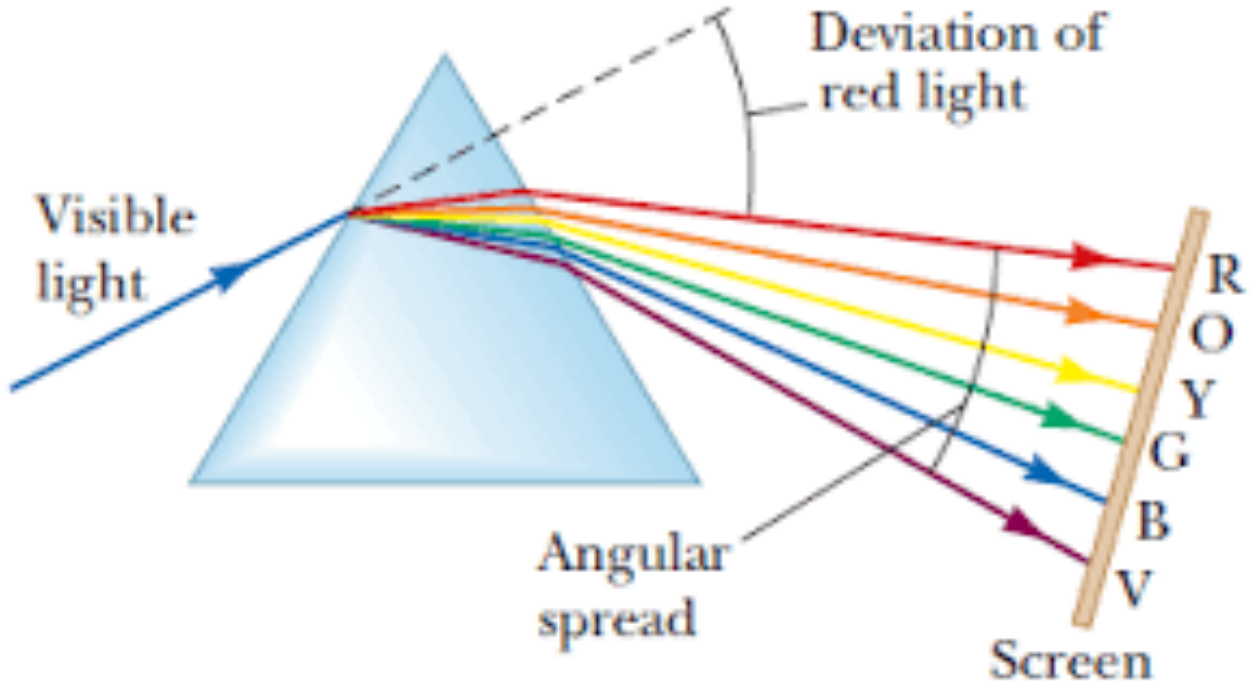# Prism

isosceles prism

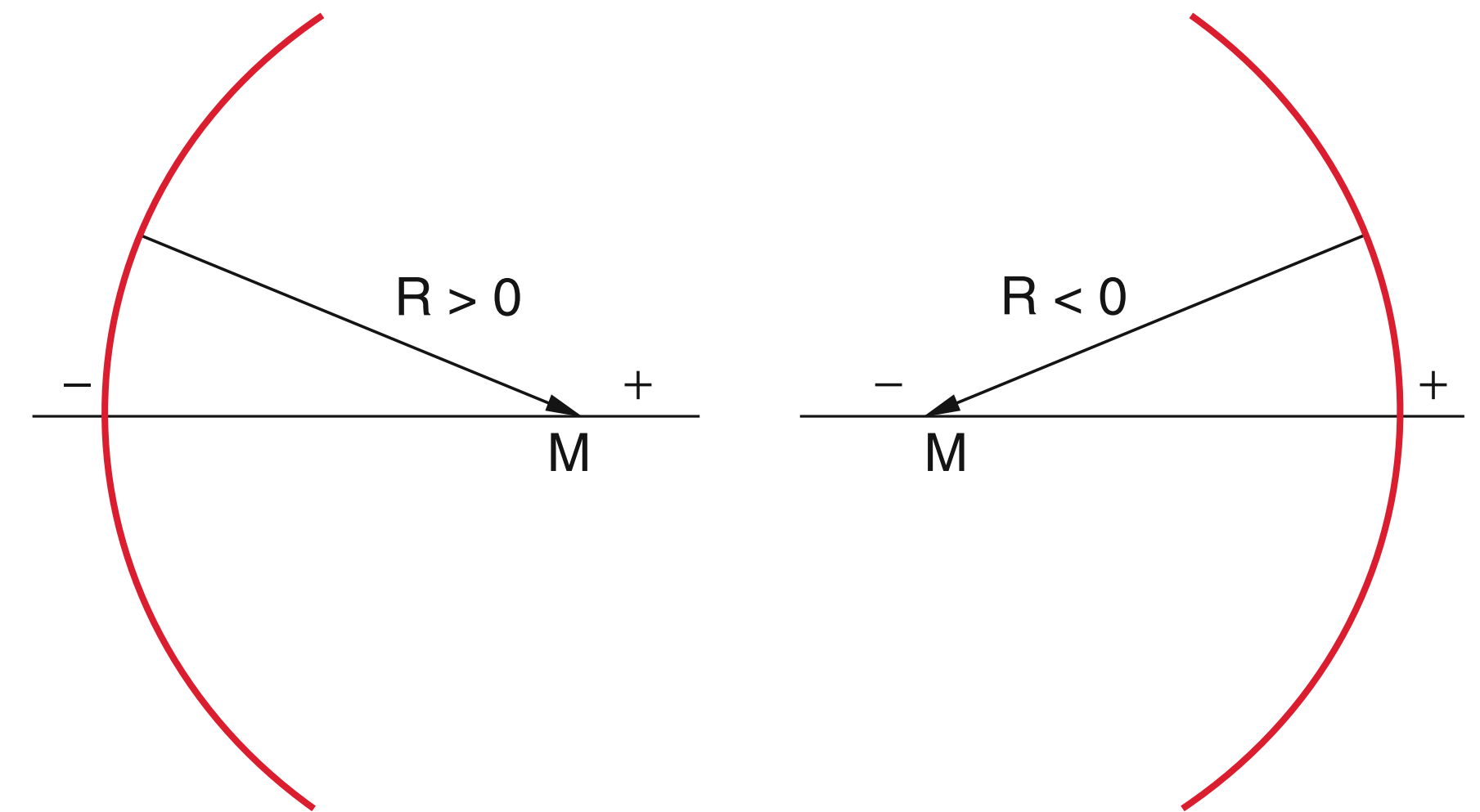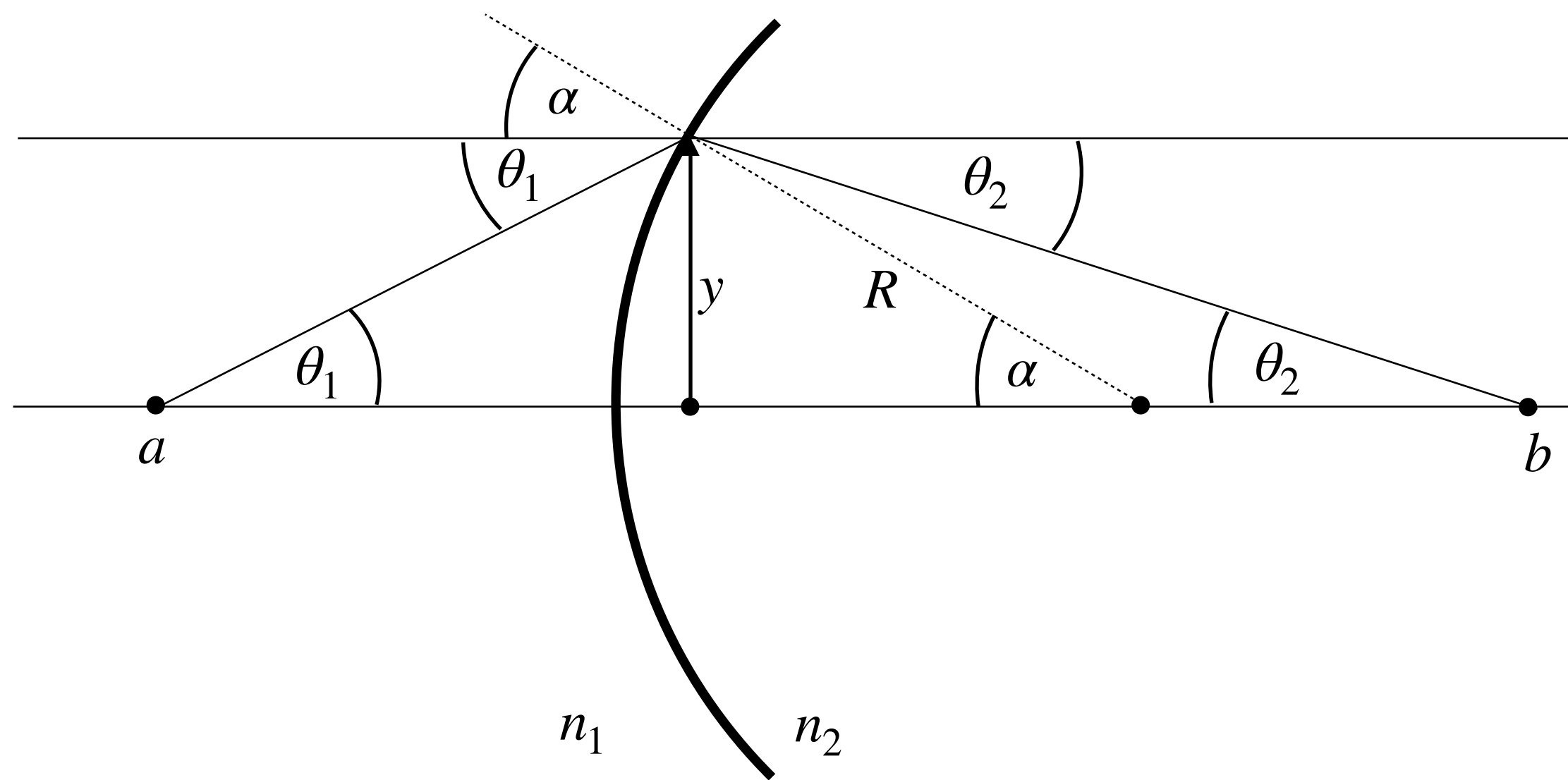# Prisms for Spectroscopy

DIY prism
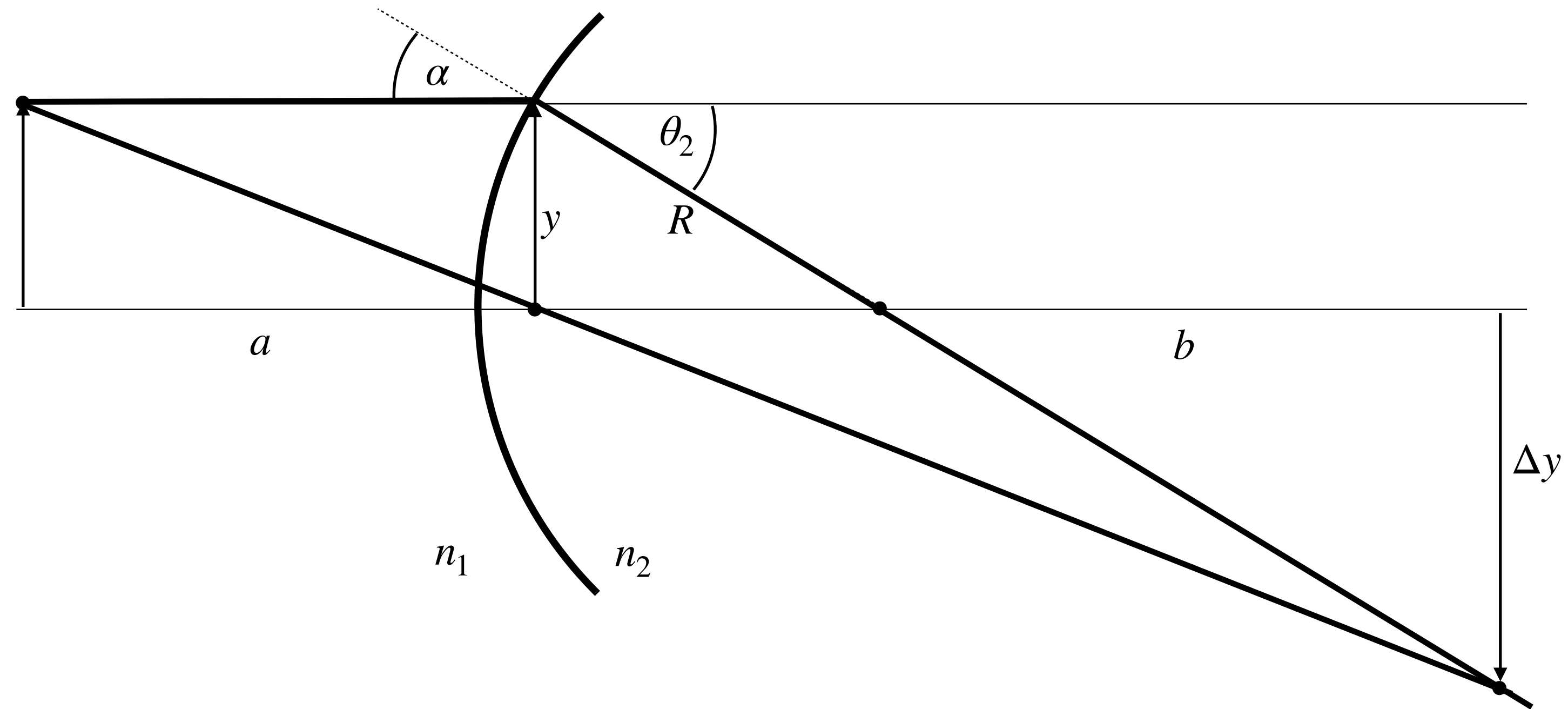

paper

flashlamp

mirror

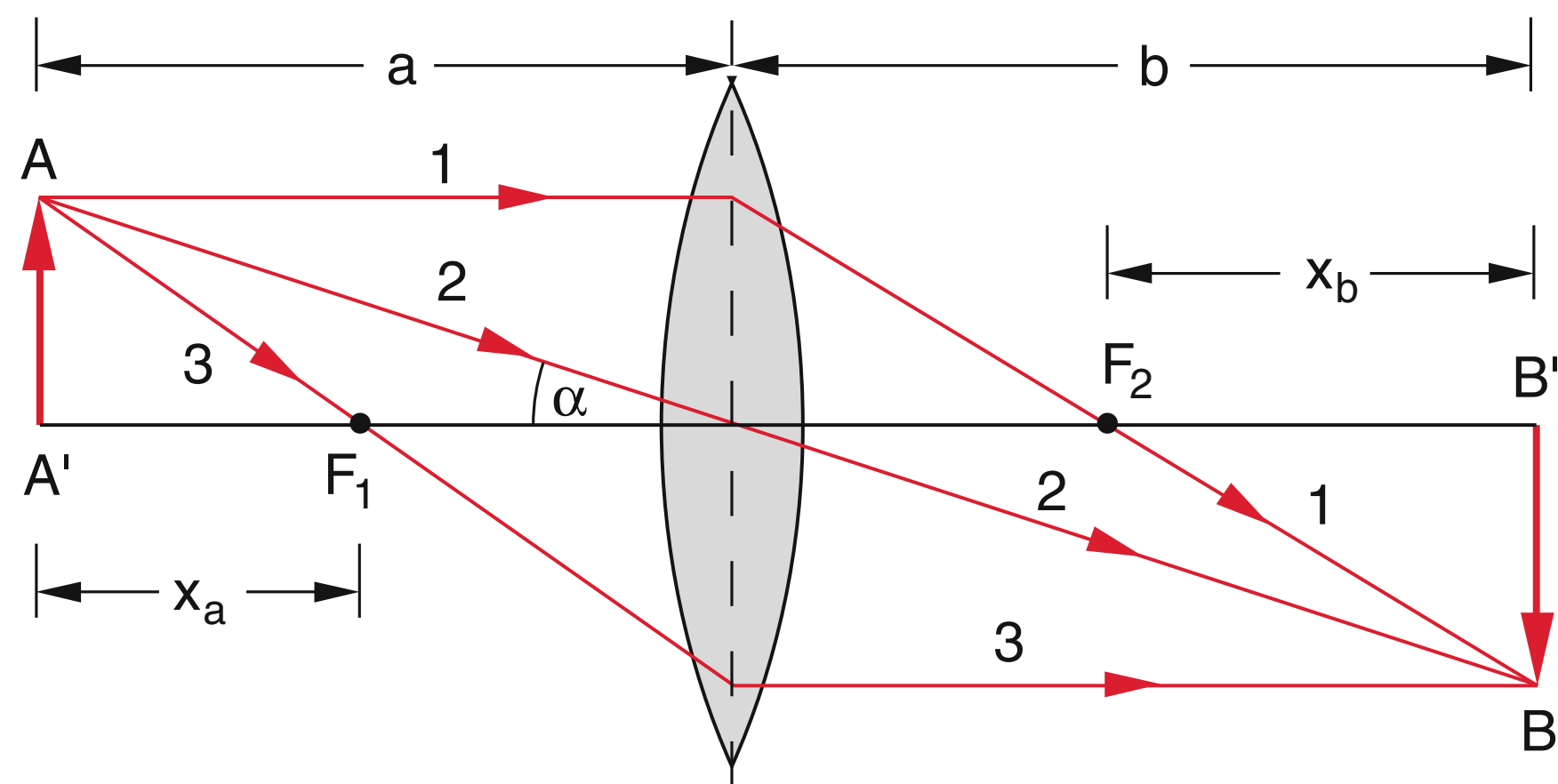water

prism

Curved Interfaces

Focal length of a curved surface
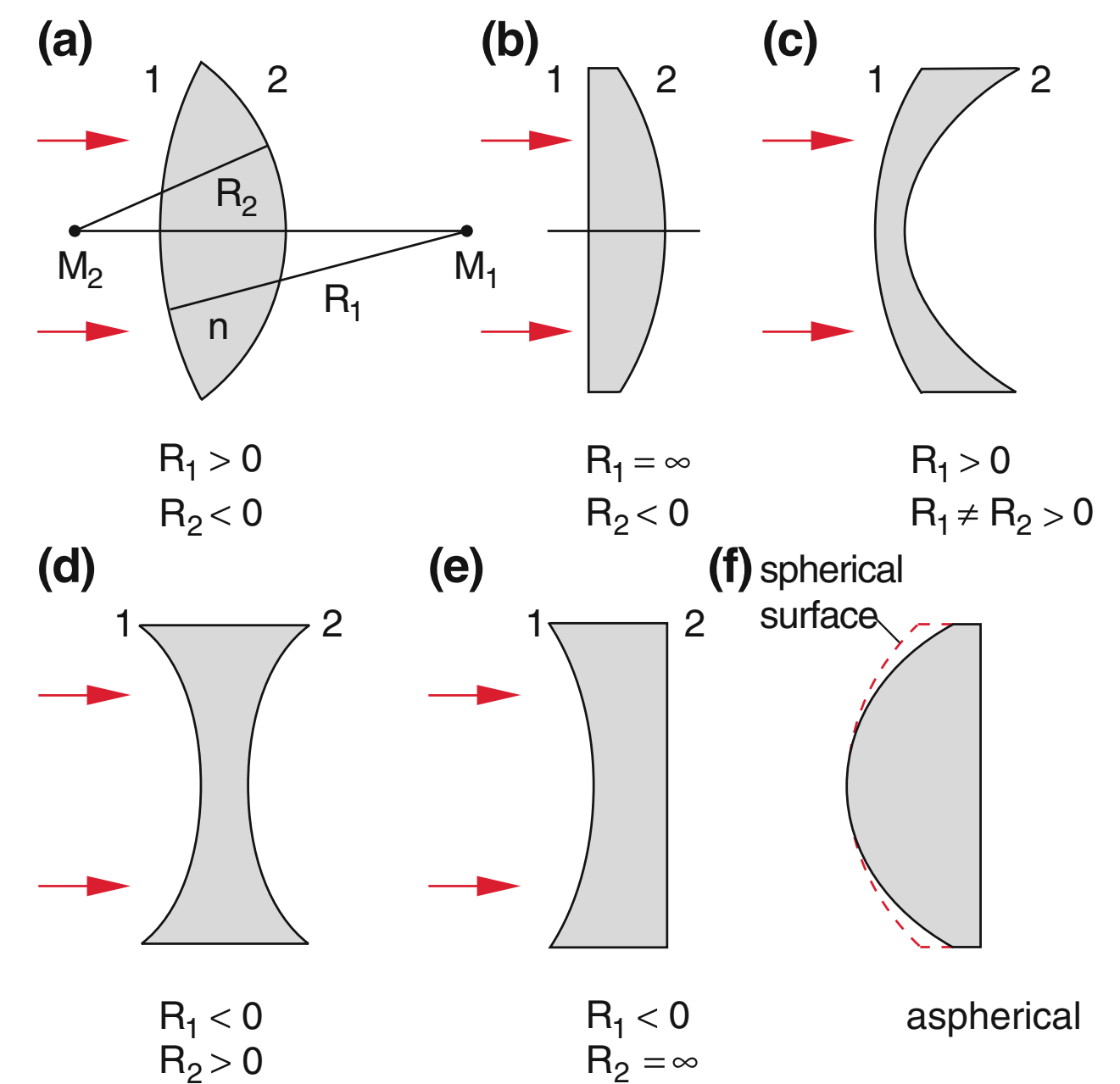
Lenses

thin lens

lens types

Fig. 9.26 Examples of different forms of lenses: **a**) convex-convex = biconvex **b**) plane-convex **c**) convex-concave **d**) biconcave **e**) concave-plane **f**) aspherical lens