Closed book. No calculators are to be used for this quiz.
Quiz duration: 10 minutes

Name: **Student ID:**   **Signature:**

An object is placed at a distance of s_1 from the input plane of a paraxial optical system. Show that if the input and output sides of the imaging system have the same refractive index, then the distance s_2 of the image from the output plane is given in general by

$$s_2 = -\frac{As_1 + B}{Cs_1 + D}$$

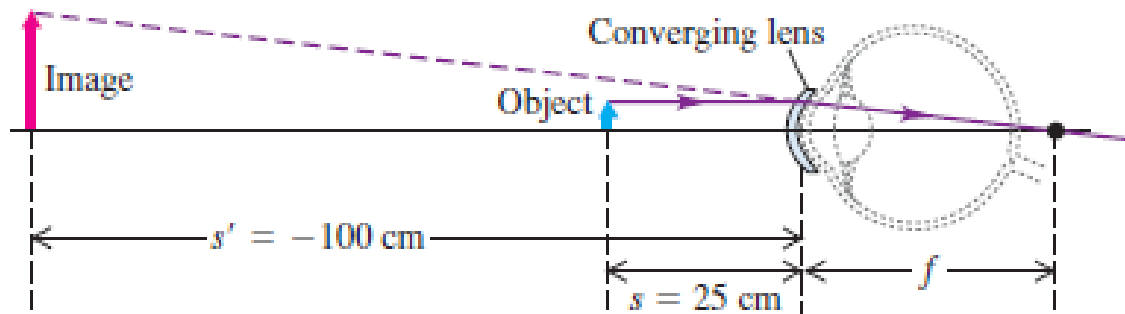**Closed book. No calculators are to be used for this quiz.**
Quiz duration: 10 minutes

Name: Student ID: Signature:

The near point of a certain hyperopic eye is 100 cm in front of the eye. Find the focal length and power of the contact lens that will permit the wearer to see clearly an object that is 25 cm in front of the eye.
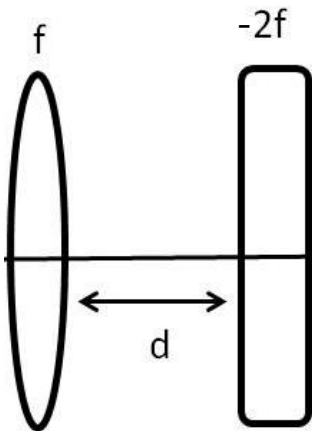
Closed book. No calculators are to be used for this quiz.
Quiz duration: 10 minutes

**Name:**   **Student ID:**   **Signature:**

Suppose you have an optical system made of a converging lens with focal length f separated from a diverging lens with focal length -2f by a distance d, as shown above. Assume a ray that is incident to the converging lens has height r_0 and inclination angle θ_0. By using ray transfer matrix method find the final ray height and inclination angle immediately after the diverging lens.

Closed book. No calculators are to be used for this quiz.
Quiz duration: 10 minutes

Name: **Student ID:**   **Signature:**

n_1 n_2

Object

C

R
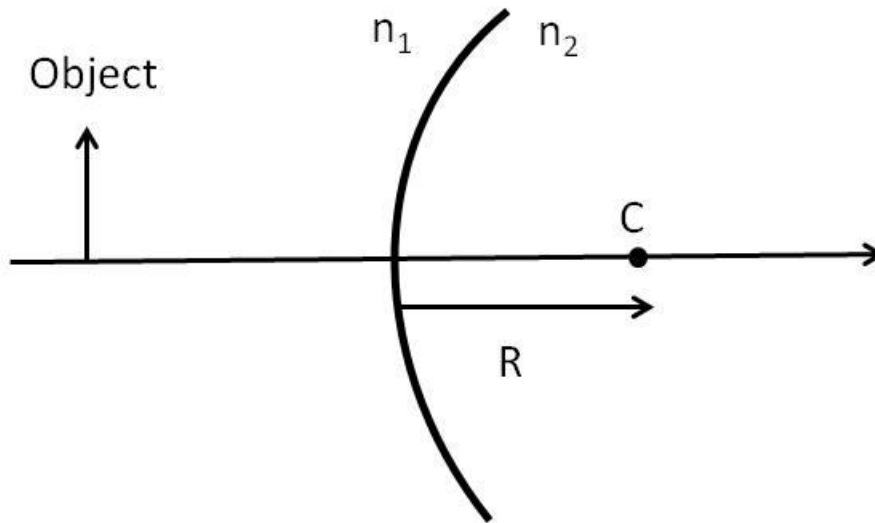
Suppose that you have an object located at a distance s_1 from a spherical interface with center of curvature C. Using ray transfer matrix method, find the image position (s_2) and magnification. ($n_1 < n_2$)

$$M_T = \begin{bmatrix} 1 & 0 \\ \dfrac{n_1 - n_2}{n_2 R} & \dfrac{n_1}{n_2} \end{bmatrix} \; Ray\ transfer\ matrix\ for\ a\ spherical\ interface$$
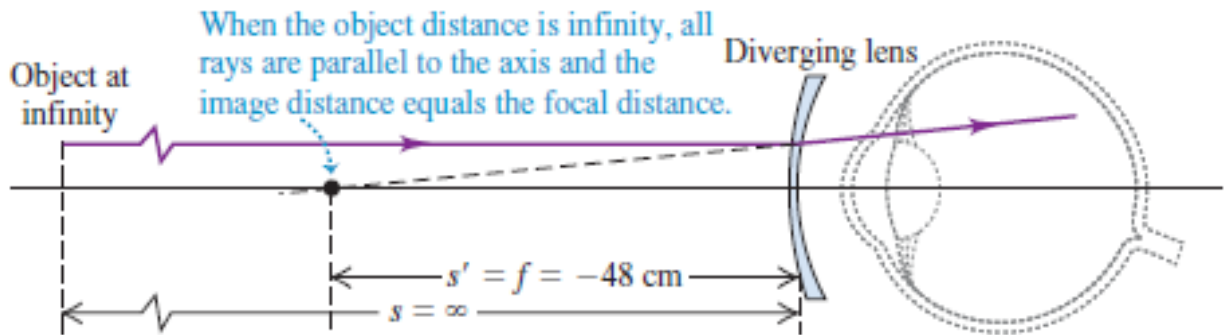
Closed book. No calculators are to be used for this quiz.
Quiz duration: 10 minutes

Name: **Student ID:**   **Signature:**

The far point of a certain myopic eye is 50 cm in front of the eye. Find the focal length and power of the eyeglass lens that will permit the wearer to see clearly an object at infinity. Assume that the lens is worn 2 cm in front of the eye.

Closed book. No calculators are to be used for this quiz.
Quiz duration: 10 minutes

Name: **Student ID:**   **Signature:**

There is an object at distance s_1 from a converging lens with focal length of f, find the distance of image from lens s_2 and its magnification using ray transfer matrices.