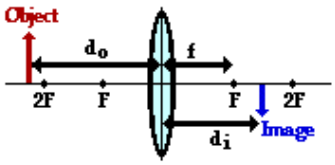
Name:_____

# Equations with Lenses
SPH3U

*The Lens Equation* (for converging or diverging lenses):




Note that all distances are measured from _____.

Example: Converging Lens

A 4.0-cm tall light bulb is placed 18 cm from a converging lens having a focal length of 12 cm. Determine the image distance.

Givens: $f =$

$d_o =$

Unknown $d_i =$

Select an Equation: $\frac{1}{f}=\frac{1}{d_i}+\frac{1}{d_o}$ becomes $\frac{1}{d_i}=\frac{1}{f}-\frac{1}{d_o}$

Substitute and Solve: $\frac{1}{d_i} =$

Similarly, the magnification of an object is the ratio of the image height, $h_i$, to the object height, $h_o$:

Or the ratio of the image distance, $d_i$, to the object distance, $d_o$:

Another Example: Determine the image height of a 5.0-cm object placed 20.0 cm from a double convex lens with a focal length of 15 cm.

First find your image distance:

Now find your image height:

Draw a 1:5 scaled ray diagram to check your answer (i.e. 1 cm on your diagram should equal 5 cm in the question):

More Practice

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