

Objects and Images

The focal length of a lens (f) is related to the distance from the lens to the object (D_o) and the distance from the lens to the image that is created (D_i) by this equation:

$$f = \frac{D_o D_i}{D_o + D_i}$$

- Determine the focal length of each lens:

lens	D_o (inches)	D_i (inches)	f
#1	25	3	
#2	30	3.5	
#3	100	2.75	
#4	50	3.25	

- Find the missing value in each case:

lens	D_o (inches)	D_i (inches)	f
#5	?	2.25	2.09
#6	40	?	2.57
#7	10	?	2.45
#8	?	2	1.94
#9	?	2	1.96
#10	10	?	3.00
#10	25	?	3.00
#10	50	?	3.00
#10	100	?	3.00
#10	200	?	3.00
#10	500	?	3.00
#10	1000	?	3.00
#10	2000	?	3.00

For lens #10, what happens to the value of D_i as D_o gets very large? (Compare D_i to the value of f .)