

Name: _____

DISC: _____

Score: ____ / 20

Instructions:

- Do your own work.
- Answer the questions below in the space provided.
- **You must show all of your work to received credit for these problems**
- Please place a box around your answers.
- Remember to give the correct units with all numerical answers

Q1

Q2

Q3

Q4

10

10

5

5

1. Consider the convex lenses and sets of candle below:

Figure (a)

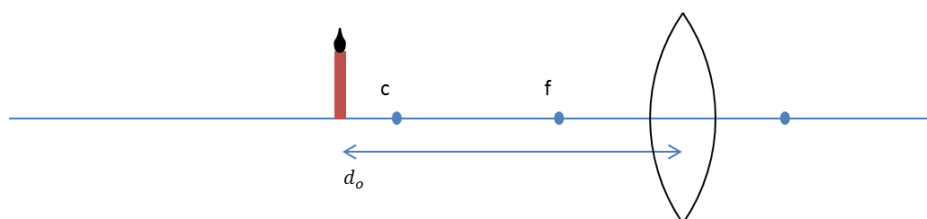
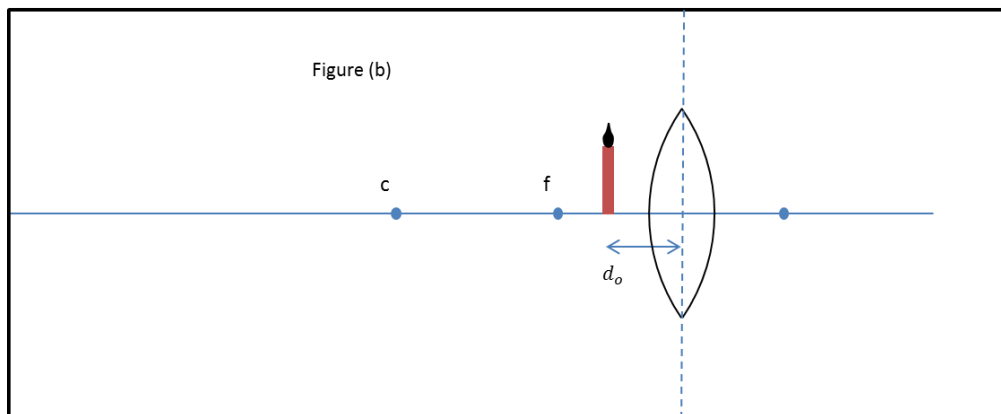


Figure (b)

SPEED OF LIGHT $c = 3 \times 10^8 \text{ m/s}$ LENS EQN $\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f}$ MAGNIFICATION $m = -d_i/d_o$

FOCAL LENGTH 10 cm

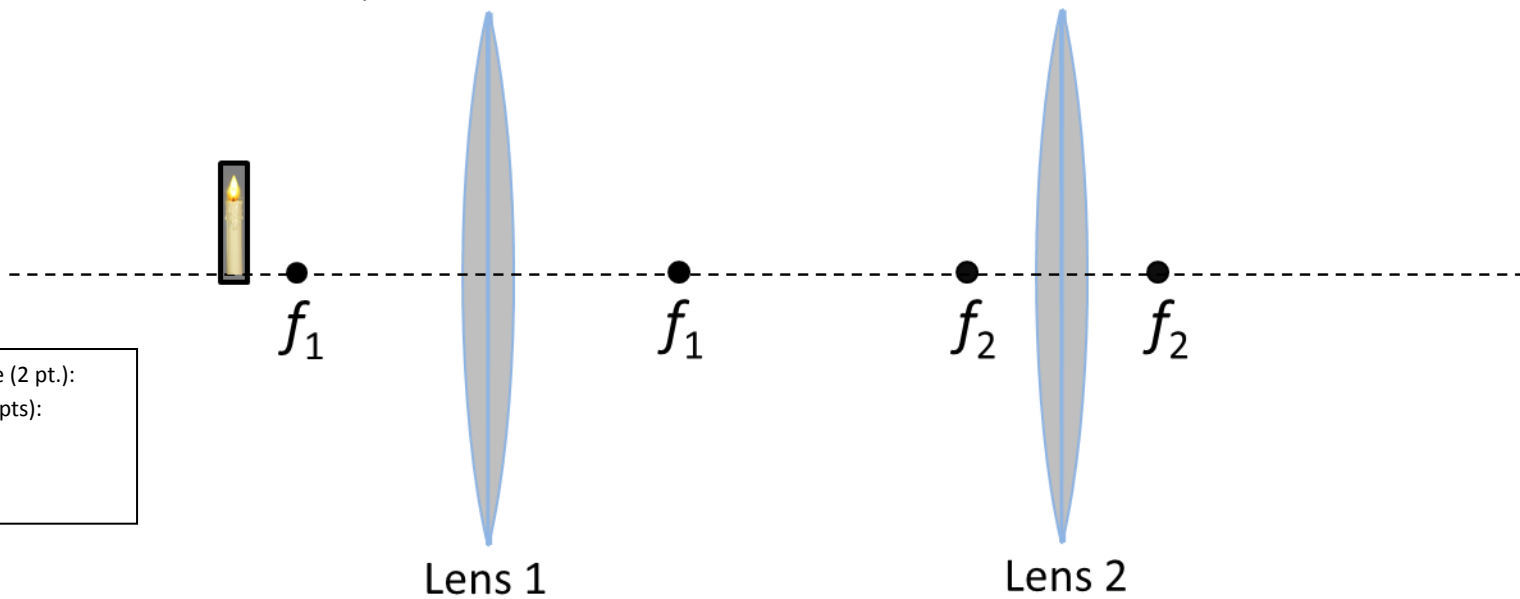
Ray-Traces (2 pts.):

- a) Draw the ray-trace diagrams for *at least two* (2) principle rays to locate the image in each diagram.
- b) Fill in the following table:

FIGURE	IMAGE TYPE	IMAGE LOCATION	ORIENTATION	MAGNIFICATION
a: $d_o = 25 \text{ cm}$	REAL/VIRTUAL/NO IMAGE		UPRIGHT/INVERTED/NO IMAGE	
b: $d_o = 5 \text{ cm}$	REAL/VIRTUAL/NO IMAGE		UPRIGHT/INVERTED/NO IMAGE	

Table (8 pts.):

2. Consider the two-lens system below:



- a) Use the ray-tracing technique to find the location of the image.
- b) Use the thin-lens equations to fill in the values requested in the table. The candle is at $d_o = 15 \text{ cm}$ to the left of Lens 1

LENS	FOCAL LENGTHS	IMAGE TYPE	IMAGE LOCATION	ORIENTATION	MAGNIFICATION
1	$f_1 = 10 \text{ cm}$	REAL/VIRTUAL/NO IMAGE		UPRIGHT/INVERTED/NO IMAGE	
2	$f_2 = 5 \text{ cm}$	REAL/VIRTUAL/NO IMAGE		UPRIGHT/INVERTED/NO IMAGE	

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