

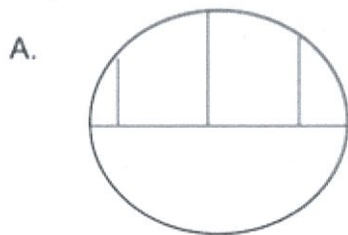
# ANSWERS.

## SBI 3C Microscope Calculations

1. Complete the following chart by calculating the missing lens or total magnification:

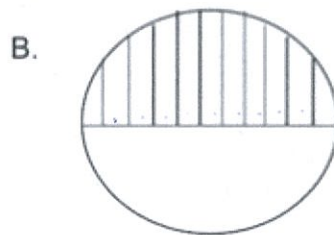
Total magnification	Ocular (eyepiece) magnification	Lens magnification
80X	5X	16x
400X	10X	40X
1000X	10X	100X
500X	10X.	50X

2. Calculate the diameter of the Field of View (FOV) on low power for each diagram which shows the lines of a ruler. Pretend the distance between all lines is 1.5 mm. Objects in the field of view are usually measured in micrometers (um) To convert, a field of view of 0.8mm, times it by 1000 to get 800um.  $0.8\text{mm} \times 1000 = 800\text{um}$ .



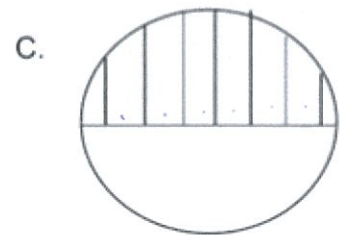
# of ruler spaces: 2.5

FOV = 2.5 mm  
2500 um



# of ruler spaces: 10

FOV = 10 mm  
1000 um



# of ruler spaces: 6.5

FOV = 6.5 mm  
6500 um

3. A microscope has a LOW power objective with a magnification of 10X and a HIGH power objective with a magnification of 40X. If the LOW power field of view diameter is 4.3 mm, calculate the diameter of the HIGH power field of view, in millimeters and in micrometers. Remember:

$$\frac{\text{diameter (LP)} \times \text{magnification of LP objective}}{\text{magnification of HP objective}} = \text{diameter (HP)}$$

LP Mag = 10x. Lp FOV = 4.3mm.  
HP Mag = 40x. HP FOV = ?

$\rightarrow \frac{(4.3 \times 10)}{40} = 1.08\text{mm}^{(2dp)}$

Final answer in millimeters: 1.08mm.

Final answer in micrometers: 1080um.

$\frac{(4.3 \times 100)}{100} = 1.08\text{mm.}$   
Same result.

Assuming the ocular lens is 10x. Total mag for each would be 100x + 400x.