

Book Back.

X - STD

Numerical problems:

① $u = -20 \text{ cm}$

$f = 10 \text{ cm}$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$\frac{1}{v} = \frac{1}{f} + \frac{1}{u}$$

$$\frac{1}{v} = \frac{1}{10} + \frac{1}{-20} = \frac{(-20) + (10)}{(10)(-20)} = \frac{-10}{-200} = \frac{1}{20}$$

$$v = 20 \text{ cm}$$

| | ⑤ | ① | CC |
|---|---|---|----|
| u | - | - | - |
| v | + | - | - |
| f | + | + | - |

$$m = \frac{v}{u} = \frac{20}{-20} = -1$$

Nature: Real & inverted as m is negative.

② Given:

$$h = 3 \text{ cm}$$

$$u = -10 \text{ cm}$$

$$f = -15 \text{ cm}$$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$\frac{1}{v} = \frac{1}{f} + \frac{1}{u}$$

$$= \frac{1}{-15} + \frac{1}{-10} = \frac{-10 - 15}{(-15)(-10)} = \frac{-25}{150}$$

$$\frac{1}{v} = \frac{1}{-6}$$

$$v = -6 \text{ cm}$$

$$m = \frac{v}{u} = \frac{-6}{-10} = +0.6$$

$$m = \frac{h'}{h}$$

$$h' = m \times h$$

$$= 0.6 \times 3$$

$$= 1.8 \text{ cm}$$

The size of the image is 1.8 cm.