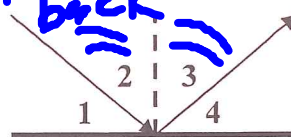# REFLECTION STUDY SHEET #2

1. When the sun has just set and the moon appears as a narrow crescent, the "dark" part of the moon can be seen. How is this possible and what is it called?

Earth Shine — *Light reflecting from Earth to moon & back*

2. In the diagram at the right, which is the angle of incidence $\angle 2$ and which is the angle of reflection? $\angle 3$

3. If you can see the eyes of someone in a complicated system of mirrors, is it possible for him/her to see your eyes?

Yes, Law of Reflection $\angle a = \angle r$

4. What is the focal length of a plane mirror?

there is not one

5. Is a real image formed by a curved mirror ever larger than the actual object?

Yes, Case 4

6. Is a virtual image formed by a curved mirror ever smaller than the actual object?

Yes, Convex

7. Where must an illuminated object be placed with reference to a **concave** mirror with a focal length of 1 meter in order for its image to be focused on a screen 6 meters from the mirror? What type of image is formed?

$S_i = 6m$
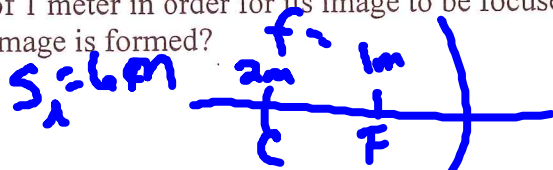
$f = -\dfrac{S_o S_i}{S_o + S_i}$

$S_o = \dfrac{S_i \cdot f}{S_i - f} = \dfrac{(6)(1)}{(6-1)} = \dfrac{6}{5}$
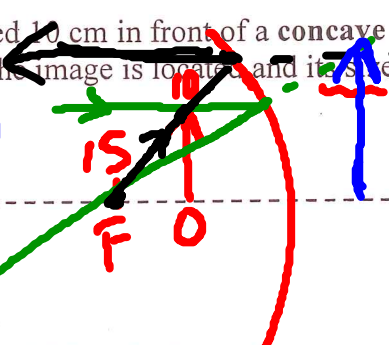
$S_o = 1.2 \, m$

8. An object is placed 25 cm from a **concave** mirror with a focal length of 10 cm. Draw a sketch and calculate where the image is located and its size.

9. An object is located 10 cm in front of a **concave** mirror whose focal length is 15 cm. Draw a sketch and calculate where the image is located and its size.

$M = -\dfrac{(-30cm)}{10cm}$

$\boxed{M = 3}$
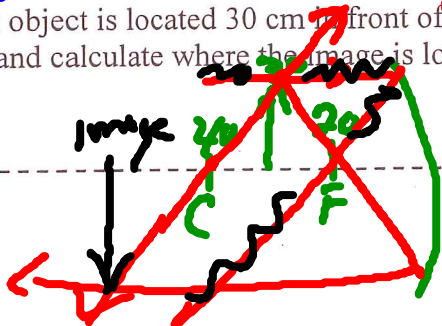
$\dfrac{1}{f} = \dfrac{1}{S_o} + \dfrac{1}{S_i}$

$\dfrac{1}{15} = \dfrac{1}{10} + \dfrac{1}{S_i}$

$\dfrac{1}{S_i} = \dfrac{2}{30} - \dfrac{3}{30}$

$\dfrac{1}{S_i} = -\dfrac{1}{30}$

$M = \dfrac{h_i}{h_o} = -\dfrac{S_i}{S_o}$

10. An object is located 30 cm in front of a **concave** mirror whose focal length is 20 cm. Draw a sketch and calculate where the image is located and its size.

image

$S_i = \dfrac{S_o f}{S_o - f} = \dfrac{(30)(20)}{(30-20)} = 60 cm$

$S_i = -30 r$

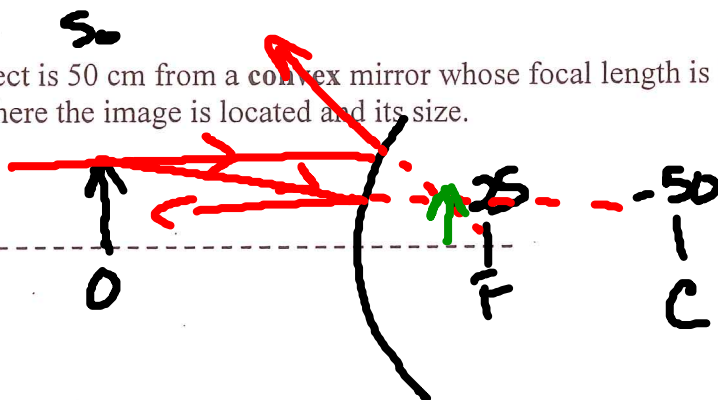$M = -\dfrac{S_i}{S_o} = -\dfrac{60}{30} = -2$

11. An object is located 6 cm in front of a **concave** mirror whose focal length is 12 cm. Draw a sketch and calculate where the image is located and its size

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12. An object is 24 cm from a **convex** mirror whose focal length is 8 cm. Draw a sketch and calculate where the image is located and its size.

S_o

13. An object is 50 cm from a **convex** mirror whose focal length is 25 cm. Draw a sketch and calculate where the image is located and its size.

$f = -25 cm$

$S_o = 50 cm$

$S_i = ?$

$S_i = ?$

$$S_i = \frac{fS_o}{S_o - f} = \frac{(-25)(50)}{50 - (-25)}$$

$$M = \frac{(-25)(50)}{75\frac{1}{3}}$$

$$M = -\frac{S_i}{S_o} = -\frac{(-16.67cm)}{50}$$

$$S_i = -\frac{50}{3} = -16.67cm$$