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Grade 10 Physics Chapter 2 Revision Problems – Answer Key

Multiple Choice Questions.

Q1.	The focal length of a spherical mirror is _____ the radius of curvature of the mirror.
a.	twice
b.	half
c.	the same as
d.	unrelated to

Q2.	What type of image is produced by a convex mirror?
a.	enlarged and real
b.	reduced and virtual
c.	enlarged and virtual
d.	reduced and real

Q3.	Light from a laser strikes a plane mirror at an angle of 38 degrees to the normal. If the angle of incidence increases by 13 degrees what is the new angle of reflection?
a.	38 degrees
b.	51 degrees
c.	65 degrees
d.	84 degrees

Q4.	A concave mirror has a 7 cm focal length. You place a 2.4 cm tall object 16 cm from the mirror. Determine the image height.
a.	7 cm
b.	4 cm
c.	- 1.9 cm
d.	- 3.5 cm

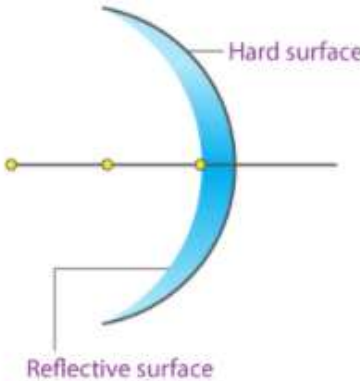
Q5.	You place an object 20 cm in front of a convex mirror with a -15 cm focal length. Calculate the image position.
a.	9.45 cm
b.	5.34 cm
c.	- 4.35 cm
d.	- 8.57 cm

Q6.	Under which conditions does a concave mirror produce an enlarged virtual image?
a.	Never
b.	When the object is farther away than the focal point
c.	When the object is farther away than the radius of curvature
d.	When the object is between the focal point and the mirror

Q7.	If $x_i = -x_o$, then what is the meaning of the negative sign?
a.	the image is inverted
b.	the image is virtual
c.	the image is smaller
d.	the image is larger

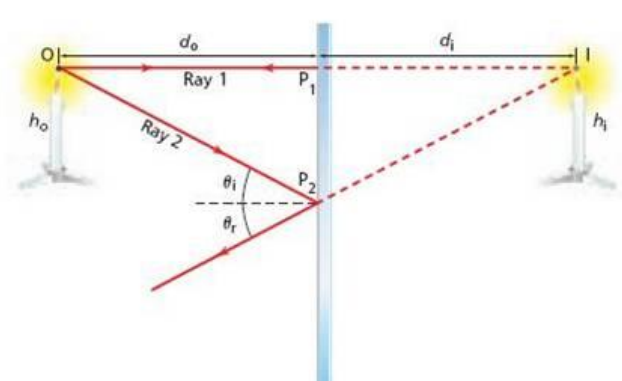
Q8.	What is the size and position of an image formed by a plane mirror?
a.	same size, closer to the mirror
b.	same size, same distance away from the mirror
c.	enlarged, closer to the mirror
d.	reduced, farther from the mirror

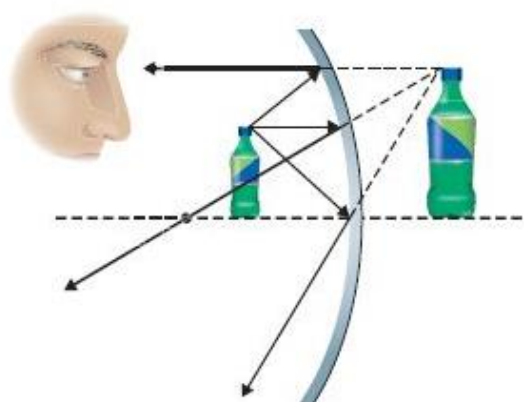
Q9.	Identify whether the following statement is true or false: "Virtual images are formed from divergent rays."
a.	True
b.	False

Q10	<p>This is an example of a _____ mirror</p> 
a.	concave
b.	convex
c.	magnifying
d.	plane

Q11	<p>In diffuse reflection, why are the reflected rays not parallel to each other?</p>
a.	because the light is of various wavelengths
b.	because this only happens in plane mirrors
c.	because the incident rays are not parallel
d.	because the surface is not smooth

Q12	<p>Where is the object located if the image that is produced by a concave mirror is smaller than the object?</p>
a.	at the mirror's focal point
b.	between the mirror and the focal point
c.	between the focal point and center of curvature
d.	outside the center of curvature

<p>Q13</p>	<p>If the flame on the candle is 2 cm tall, how tall is the flame of the image?</p> 
<p>a.</p>	<p>1 cm</p>
<p>b.</p>	<p>2 cm</p>
<p>c.</p>	<p>4 cm</p>
<p>d.</p>	<p>8 cm</p>

<p>Q14</p>	<p>Which terms describe the reflection seen in this image?</p> 
<p>a.</p>	<p>virtual, upright</p>
<p>b.</p>	<p>virtual, inverted</p>
<p>c.</p>	<p>real, upright</p>
<p>d.</p>	<p>real, inverted</p>

<p>Q15</p>	<p>Which of the following mirrors have a focal point?</p>
<p>a.</p>	<p>Plane mirrors only</p>
<p>b.</p>	<p>concave mirrors only</p>
<p>c.</p>	<p>plane, convex, and concave mirrors</p>
<p>d.</p>	<p>concave and convex mirrors only</p>

Constructed Response Questions.

Q1

A concave mirror has a radius of curvature of 24 cm. A 6.4 cm tall object is held 26cm from the mirror.

a) Where is the image and what distance from the mirror is the image?

$$f = C/2$$
$$= 24/2$$
$$= 12 \text{ cm}$$

$$1/f = 1/x_i + 1/x_o$$

$$x_i = f x_o / x_o - f$$

$x_i = 22.3 \text{ cm}$. The image is 22.3cm in front of the mirror

b) How tall is the image?

$$h_i/h_o = x_i/x_o$$

$$h_i = h_o x_i / x_o$$

$h_i = - 5.5 \text{ cm}$. The image is 5.5cm tall and inverted.

Q2. A 4.0 cm tall light bulb is placed a distance of 35.5 cm from a convex mirror having a focal length of -12.2 cm.

a) What is the image distance?

$$1/f = 1/x_i + 1/x_o$$

$$x_i = fx_o / x_o - f$$

$$x_i = -9.8 \text{ cm}$$



b) How tall is the image?

$$h_i/h_o = x_i/x_o$$

$$h_i / (4.0 \text{ cm}) = - (-9.08 \text{ cm}) / (35.5 \text{ cm})$$

$$h_i = 1.02 \text{ cm}$$