



16 - Exercises

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* Energy of photons can be expressed:

* a) $E = \frac{1}{2}mv^2$

* b) $E = mgh$

* c) $E = hc/\lambda$

* d) $E = hfc/\lambda$

* Electromagnetic radiation wavelength $2 \cdot 10^{-11} \text{m}$ represent

* a) x-rays

* b) gamma rays

* c) UV

* d) VIS

- * Electromagnetic radiation wavelength $2 \cdot 10^{-4} \text{m}$ cannot represent:
- * a) radio waves
- * b) microwaves
- * c) ultrared waves
- * d) visible light

Electromagnetic radiation has a frequency 10MHz. Calculate its energy and wavelenght

Electromagnetic radiation has a wavelength 30cm. Calculate its energy and frequency.

Foton has a frequency 8×10^{14} Hz. Calculate its energy and wavelength.

Speed of light in a glass is 140 000km/s. Calculate index of refraction of the glass.

What is speed of light in ethanol? ($n=1,28$)

Could be $n < 1$?

Calculate dioptric power if focal distance is 5m.

Calculate dioptric power if object distance is 20cm and image distance is 40cm.

Dioptric power of a lens is 5D, calculate the object distance if you know that image distance is 10cm.

You place an object 20cm in front of a convex lens with a 10cm focal length.
Determine the image position

You place an object 50cm in front of a concave mirror with a 10cm radius of the mirror.
Determine the image position.

Image position is 50cm. Concave mirror has 10cm radius of curvature. Determine the object position.

Calculate linear magnification of a lens, if you know that object height is 20mm and image height is 5m.

Calculate linear magnification of a mirror, if you know that object distance is 10cm and focal length is 15cm.

An object near a convex lens produces a 3cm tall real image that is 12cm from the lens and inverted. If the focal distance (length) of the lens is 7cm, what are the object position and height?

An object near a concave mirror produces a 15cm tall real image that is 24cm from the mirror and inverted. If the radius of the mirror is 8cm, what are the object position and height?

* Chromatic aberration is caused by:

* a) thick lenses

* b) light dispersion

* c) focal distances

* d) wavelength used light