

Lenses Magnification

GCSE Physics · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

An object 2.0 cm tall forms an image 6.0 cm tall through a lens. Calculate the magnification. (2 marks)

Step 1 · Equation (on the equation sheet)

$$\text{magnification} = \text{image height} \div \text{object height}$$

Step 2 · Calculate

$$6.0 \div 2.0 = 3.0$$

Answer: 3.0 (no unit)

Check: Both heights must be in the same unit; the units cancel.

2. Now try one with the steps

Describe the image formed by a convex lens used magnifying glass, and where the object must be. (3 marks)

Step 1 · Object position

Step 2 · Image

Step 3 · Where

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Describe the difference between a convex lens and a concave lens. [2]

2. Define the principal focus of a convex lens. [1]

3. Define focal length. [1]

4. An object 2.0 cm tall forms an image 6.0 cm tall. Calculate the magnification. [2]

5. Describe how the symbols for a convex lens and a concave lens differ in a ray diagram. [1]

6. Explain the difference between a real image and a virtual image. [2]

7. Describe the image formed when a convex lens is used magnifying glass. [3]

8. Describe the image formed by a concave lens. [3]

9. A lens has a magnification of 0.50. The object is 4.0 cm tall. Calculate the image height. [2]

10. Explain why magnification has no unit. [1]

11. A camera's convex lens photographs a distant tree. Describe the image formed on the sensor. [3]

12. Describe how to draw a ray diagram to locate the image formed by a convex lens. [3]

13. A projector forms an image 25 times larger than a 3.6 cm tall slide. Calculate the height of the image on the screen. [2]

14. Explain why a more strongly curved convex lens has a shorter focal length. [1]

4. Before you hand it in

"A concave lens can form a real image."

A concave lens always forms a virtual, upright, diminished image.

Drawing rays that bend at random angles

Use the standard rays: parallel ray → through F; ray through the centre goes straight on.

Giving magnification a unit, or dividing object by image

Magnification = image height ÷ object height, with no unit.

Using 'big' or 'small' to describe images

Use real or virtual; upright or inverted; magnified, same size or diminished.