REFRACTION AND LENSES PRACTICE TEST (SAMPLE)

STUDY GUIDE

SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://refractionlenses.examzify.com

Table of Contents

Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

1. A real image formed by a lens of a diamond ring is which of the following?

A. It is upside down.

B. It could be captured on film.

C. It is larger than the actual ring.

D. It was formed by a concave lens.

2. Prisms separate white light by wavelength. Which term best describes this process?

A. Absorption

B. Reflection

C. Dispersion

D. Refraction

3. In ray tracing for a thin lens, which ray goes through the optical center without bending?

A. A ray parallel to the axis

B. A ray that passes through the focal point on the object side

C. A ray that passes through the focal point on the image side

D. The ray that goes through the optical center

4. A ray parallel to the axis passes through the focal point on the opposite side after refraction by a convex lens. This is a property of which lens type?

A. Convex (converging) lens

B. Concave lens

C. Plane lens

D. Doublet lens

5. When light bends around an object, the light is_____.

A. Reflected

B. Refracted

C. Absorbed

D. Scattered

6. If an object is located beyond the focal length of a convex lens, the image formed is real and located on the opposite side. True or false?

A. False

B. It depends on orientation

C. Only if the object is at infinity

D. True

7. To triple the telescope magnification M ≈ f_o / f_e while keeping f_e constant, what should you do to f_o?

A. Double f_o

B. Triple f_o

C. Half f_o

D. Double f_e

8. A diverging lens (negative focal length) typically forms what type of image for a distant object?

A. Real upright

B. Virtual upright

C. Real inverted

D. Virtual inverted

9. Which ray emerges parallel to the axis after refraction from a convex lens?

A. A ray that was parallel to the axis becomes directed toward the focal point on the opposite side.

B. A ray aimed at the focal point on the object side emerges parallel to the axis.

C. A ray that passes through the focal point on the image side emerges parallel to the axis.

D. The ray that goes through the optical center continues undeviated.

10. Two thin lenses in contact with f1 = +40 cm and f2 = +20 cm yield an effective focal length of approximately:

A. +60 cm

B. +40 cm

C. +13.33 cm

D. +20 cm

Answers

1. A
2. C
3. D
4. A
5. B
6. D
7. B
8. B
9. A
10. C

Explanations

1. A real image formed by a lens of a diamond ring is which of the following?

A. It is upside down.

B. It could be captured on film.

C. It is larger than the actual ring.

D. It was formed by a concave lens.

Real images are formed when light actually converges to a point after passing through the lens, so the rays cross. For a converging (convex) lens, this crossing causes the image to invert relative to the object. So a real image of a diamond ring would appear upside down. That inversion is the defining feature of a real image, unlike virtual images which stay upright. It's also true that real images can be projected onto film or a screen and that their size can be larger or smaller depending on distance, but the key point here is the inverted orientation. A concave lens, in standard setups, does not produce a real image of a real object.

2. Prisms separate white light by wavelength. Which term best describes this process?

A. Absorption

B. Reflection

C. Dispersion

D. Refraction

Dispersion describes how a prism splits white light into its component wavelengths because the glass bends different colors by different amounts. The refractive index varies with wavelength, so shorter wavelengths bend more than longer ones, and the colors separate to form a spectrum. Absorption would remove some colors, not reveal them as a spread; reflection would bounce light away rather than transmit a spectrum; refraction is the general bending at a boundary, but the wavelength-dependent bending that creates the rainbow all comes from dispersion.

3. In ray tracing for a thin lens, which ray goes through the optical center without bending?

A. A ray parallel to the axis

B. A ray that passes through the focal point on the object side

C. A ray that passes through the focal point on the image side

D. The ray that goes through the optical center

In thin-lens ray tracing, a key rule is that a ray passing through the optical center goes straight without bending. This happens because, in the thin-lens approximation, the two refracting surfaces are so close together that the refractions cancel, so the ray continues along its original path. This undeviated central ray serves as one of the foundational rays used to locate the image, along with the other two standard rays: a ray parallel to the principal axis that refracts through the focal point on the image side, and a ray that passes through the focal point on the object side that exits the lens parallel to the principal axis. By tracing these rays, you can determine where they intersect to find the image position.

4. A ray parallel to the axis passes through the focal point on the opposite side after refraction by a convex lens. This is a property of which lens type?

A. Convex (converging) lens

B. Concave lens

C. Plane lens

D. Doublet lens

Understanding how a converging lens handles rays parallel to the axis. For a convex (converging) lens, a ray that travels parallel to the principal axis is refracted by the lens in such a way that it passes through the focal point on the opposite side of the lens. This is a fundamental rule used in ray diagrams for thin lenses: parallel rays become focused through the far focal point. The same lens would take a ray aimed at the focal point on its near side and bend it to travel parallel to the axis after emerging from the lens. A concave lens would cause the parallel ray to diverge, appearing to come from the near focal point on the same side, not converge to the far focal point. A plane lens would not bring parallel rays to a focus, and a doublet lens is just two lenses combined—it's the convex lens's behavior that specifically demonstrates this parallel-to-far-focus property.

5. When light bends around an object, the light is_____.

A. Reflected

B. Refracted

C. Absorbed

D. Scattered

Light bends when it moves from one medium to another with a different optical density, changing speed and direction. This change at the boundary is refraction, which explains why the light path curves rather than simply bouncing off the surface, being absorbed, or scattering in many directions. A familiar example is a straw appearing bent in a glass of water—the change in medium causes the light to refract. Note that bending around an object is typically described by diffraction, but among the given options, refraction best fits the idea of the light changing direction at a boundary.

6. If an object is located beyond the focal length of a convex lens, the image formed is real and located on the opposite side. True or false?

A. False

B. It depends on orientation

C. Only if the object is at infinity

D. True

A converging (convex) lens can form a real image on the opposite side when the object is farther than its focal length. This happens because the refracted rays from the lens actually meet at a point on the far side, not just appear to diverge. In a standard ray construction, a ray from the object parallel to the axis is bent through the focal point on the far side, while a ray passing through the focal point on the object side exits parallel to the axis; those two rays intersect on the opposite side, creating a real, inverted image. The lens equation 1/f = 1/do + 1/di confirms this: if the object distance do is greater than f, the image distance di is positive, meaning a real image forms on the far side. If the object were between the focal length and the lens, the image would be virtual on the same side; at infinity, the image would be at the focal plane. So the statement is true.

7. To triple the telescope magnification M ≈ f_o / f_e while keeping f_e constant, what should you do to f_o?

A. Double f_o

B. Triple f_o

C. Half f_o

D. Double f_e

Magnification for a telescope is the ratio of the objective's focal length to the eyepiece's focal length. If the eyepiece focal length is kept fixed, the magnification increases directly with the objective focal length. So to triple the magnification, you need to triple the objective focal length. In other words, M scales with f_o when f_e is fixed, so f_o_new = 3 × f_o_old. Doubling f_o would double the magnification, halving f_o would halve it, and changing the eyepiece would alter magnification inversely, which isn't being done here.

8. A diverging lens (negative focal length) typically forms what type of image for a distant object?

A. Real upright

B. Virtual upright

C. Real inverted

D. Virtual inverted

Diverging (concave) lenses produce virtual images for any object distance, and for a distant object the incoming parallel rays become diverging after the lens as if they came from a focal point on the same side as the object. That means the image is virtual (light doesn't actually cross to form a real image on the opposite side), upright, and typically smaller than the object. So the correct description is a virtual upright image. It wouldn't be real or inverted with a single diverging lens for a distant object.

9. Which ray emerges parallel to the axis after refraction from a convex lens?

A. A ray that was parallel to the axis becomes directed toward the focal point on the opposite side.

B. A ray aimed at the focal point on the object side emerges parallel to the axis.

C. A ray that passes through the focal point on the image side emerges parallel to the axis.

D. The ray that goes through the optical center continues undeviated.

Rays in a convex lens bend in predictable ways relative to focal points and the axis. A ray that is parallel to the principal axis before entering the lens refracts to pass through the focal point on the opposite side. Conversely, a ray that is aimed at the focal point on the object side before entering the lens emerges parallel to the axis on the image side. A ray that goes through the optical center is undeviated. So, to get an emergent ray parallel to the axis, the incoming ray must be aimed at the focal point on the object side. The scenario where a parallel ray is refracted toward the far focal point describes the other rule, not the emergent parallel case.

10. Two thin lenses in contact with f1 = +40 cm and f2 = +20 cm yield an effective focal length of approximately:

A. +60 cm

B. +40 cm

C. +13.33 cm

D. +20 cm

When two thin lenses are in contact, their powers add to give a single focal length. Since power P = 1/f, the combined lens has 1/f_total = 1/f1 + 1/f2. Plugging in f1 = +40 cm and f2 = +20 cm: 1/f_total = 1/40 + 1/20 = 0.025 + 0.05 = 0.075 cm ¹ f_total = 1/0.075 ≈ 13.33 cm The positive focal length means the combined lens is converging, so the effective focal length is about +13.33 cm.

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

https://refractionlenses.examzify.com

We wish you the very best on your exam journey. You've got this!