Geodesy Refresher Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

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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 geodetic technique in which a laser signal is transmitted from a ground-based station, reflects off specially designed mirrors (retro-reflectors) placed on satellites, and is received back at the station.**

   A. Radar Interferometry

   B. Satellite Laser Ranging (SLR)

   C. Lunar Geodesy

   D. Global Navigation Satellite System

2. **What is the minimum triangulation station spacing for a third-order network consisting of class I and II?**

   A. 0.50 km

   B. 5.00 km

   C. 10.00 km

   D. 15.00 km

3. **Which combination has a maximum average triangle closure of 5 arcseconds?**

   A. First order

   B. Second order, Class I

   C. Third order, Class II

   D. Third order, Class I

4. **For a second-order, class II geodetic control network, minimum triangulation station spacing is at least?**

   A. 15.00 km

   B. 5.00 km

   C. 10.00 km

   D. 0.50 km

5. **In second order, class II geodetic control, the average triangle closure should not exceed how many arcseconds?**

   A. 1.0 arcseconds

   B. 2.0 arcseconds

   C. 2.5 arcseconds

   D. 3.0 arcseconds

6. Which statement about DOP is true?

A. DOP increases when satellite geometry improves.

B. DOP depends only on time of day.

C. DOP decreases with better geometric spread of satellites.

D. DOP is a measure of atmospheric delay.

7. A __________ of a sphere is the trace in its surface of the intersection of a plane passing through the center of the sphere.

A. Small circle

B. Circle of latitude

C. Great circle

D. Equator circle

8. Which expedition was led by Maupertuis during the 1730s geodetic missions?

A. Lapland

B. Peru

C. Cayenne

D. Paris

9. In a gnomonic projection, which option correctly states the portion of the sphere that can be projected onto a finite map?

A. Less than half

B. All

C. More than half

D. Exactly half

10. What is the method called when you determine the position of an unknown point by occupying points with known coordinates?

A. Resection

B. Resection, known

C. Observation

D. Intersection

Answers

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

Explanations

1. **A geodetic technique in which a laser signal is transmitted from a ground-based station, reflects off specially designed mirrors (retro-reflectors) placed on satellites, and is received back at the station.**

   A. Radar Interferometry

   B. Satellite Laser Ranging (SLR)

   C. Lunar Geodesy

   D. Global Navigation Satellite System

The main idea being tested is how we measure precise distances to satellites using a laser. Satellite Laser Ranging sends a laser pulse from a ground station to a satellite that carries retro-reflectors, the pulse bounces back, and the round-trip time is measured to compute the distance with extreme accuracy. This setup enables precise orbit determination and monitoring of Earth's shape, rotation, and other geodetic parameters. The retro-reflectors on satellites like LAGEOS are key to making the reflection reliable. Other methods listed use different signals: radar interferometry relies on microwaves for imaging surface movement, lunar geodesy involves ranging to the Moon rather than a satellite, and GNSS uses radio signals for positioning without laser reflection from satellite retro-reflectors. So the described technique is Satellite Laser Ranging.

2. **What is the minimum triangulation station spacing for a third-order network consisting of class I and II?**

   A. 0.50 km

   B. 5.00 km

   C. 10.00 km

   D. 15.00 km

Triangulation station spacing is about balancing the geometry of the network with the precision of angle measurements. In a third-order network using class I and II stations, the spacing should be just enough to keep the triangles well conditioned while not demanding impractical density. About five kilometers between stations hits that balance: it's small enough to maintain good angular accuracy for the network's scale and instrument capabilities, yet not so dense as to be unnecessarily costly for a third-order network. Spacing much smaller, like half a kilometer, would be overly dense for this order, while spacing much larger, such as ten or fifteen kilometers, would risk degrading the network's overall accuracy for these classes.

3. Which combination has a maximum average triangle closure of 5 arcseconds?

A. First order

B. Second order, Class I

C. Third order, Class II

D. Third order, Class I

Understanding triangle closure helps you see how measurement quality and network design affect how well a triangulation closes on itself. Triangle closure is the residual you get when you complete a triangle from three survey points; smaller average closures mean better geometry and more precise observations. As you use a higher-order network, triangles become smaller and the geometry improves, and when you pair that with a higher-precision data class, the expected average closure tightens further. This combination—third order with Class II—aligns with a scenario where you can keep the maximum average triangle closure around 5 arcseconds. The other options involve coarser networks or lower precision, which would typically yield larger average closures, not as small as 5 arcseconds. So, the choice of third order, Class II is the one that matches a maximum average triangle closure of 5 arcseconds.

4. For a second-order, class II geodetic control network, minimum triangulation station spacing is at least?

A. 15.00 km

B. 5.00 km

C. 10.00 km

D. 0.50 km

In triangulation networks, how far apart stations are is chosen to keep the geometry strong enough to meet the required accuracy while avoiding unnecessary cost. For a second-order, class II geodetic control network, the spacing must be large enough to prevent overly dense work but small enough to keep angular measurements from translating into large coordinate errors. The commonly accepted minimum is about 5 kilometers. This length keeps triangle sides short enough that typical instrument precision in angle observations doesn't push the network beyond its second-order tolerances, while still providing enough redundancy for a reliable adjustment. Placing stations much closer (like 0.5 km) would waste effort without meaningful gains in accuracy, whereas much larger spacings (10–15 km) could compromise the intended accuracy by allowing error accumulation to grow along longer lines.

5. In second order, class II geodetic control, the average triangle closure should not exceed how many arcseconds?

A. 1.0 arcseconds

B. 2.0 arcseconds

C. 2.5 arcseconds

D. 3.0 arcseconds

In a second-order, class II geodetic control network, triangle closure is a measure of how well the measured angles and sides form a closed geometric loop. Because observations have finite precision and possible biases, the sum of angles in a triangle or the loop of distances won't be perfect, so there is a small misclosure that serves as a quality check for the network. The average triangle closure, expressed in arcseconds, captures how much these closures deviate on average across all triangles in the network. For this level of network, a tolerance of about 3 arcseconds is the standard target. This limit reflects a balance: it's tight enough to ensure reliable precision after the network is adjusted, but not so strict as to be impractical given typical field conditions and instrument limits for second-order work. If the average misclosure approaches or exceeds this level, it signals that revisiting observations or reweighting/adjusting the data is warranted to restore internal consistency. Smaller tolerances would be more appropriate for higher-order networks, while larger tolerances would undermine the network's reliability.

6. Which statement about DOP is true?

A. DOP increases when satellite geometry improves.

B. DOP depends only on time of day.

C. DOP decreases with better geometric spread of satellites.

D. DOP is a measure of atmospheric delay.

DOP measures how the arrangement of satellites in the sky influences how errors in the measurements translate into errors in the computed position. When satellites are well spread out around you, the geometry gives strong constraints, so the same measurement errors have less impact on the final position—DOP becomes smaller. If satellites cluster in a small portion of the sky, the geometry is weak and those errors get amplified, making the position less precise—DOP becomes larger. So as the geometric spread of satellites improves, DOP decreases, which is why this statement is true. Other ideas don't fit because DOP isn't about what time of day it is or atmospheric delays; it's about satellite geometry.

7. A _________ of a sphere is the trace in its surface of the intersection of a plane passing through the center of the sphere.

A. Small circle

B. Circle of latitude

C. Great circle

D. Equator circle

When a plane cuts a sphere and passes through the sphere's center, the curve where the plane meets the surface is a great circle. A great circle is a circle on the sphere whose center is the same as the sphere's center, so its radius equals the sphere's radius. The reason this trace is the best answer is that the intersecting plane contains the center, giving a cross-section with the largest possible radius, equal to the sphere's. If the plane didn't pass through the center, the cross-section would be a smaller circle (a small circle); a circle of latitude is another example of a small circle, except the equator is a great circle because it goes through the center.

8. Which expedition was led by Maupertuis during the 1730s geodetic missions?

A. Lapland

B. Peru

C. Cayenne

D. Paris

The main idea here is who led the northern leg of the French Geodesic Mission in the 1730s. Maupertuis commanded the Lapland expedition, sending scientists to measure a meridian arc in Lapland (around the Torne Valley near the Arctic Circle) during 1736–1737. The goal was to determine the shape of the Earth by comparing how a degree of latitude sizes line up at different places. This Lapland measurements, taken alongside the equatorial measurements carried out in Peru, helped show that the Earth is oblate—flattened at the poles—which aligned with Newton's prediction. So, Maupertuis led the Lapland expedition. The Peru leg was led by La Condamine, and the Cayenne effort involved other members of the mission; Paris was not an expedition.

9. In a gnomonic projection, which option correctly states the portion of the sphere that can be projected onto a finite map?

A. Less than half

B. All

C. More than half

D. Exactly half

In a gnomonic projection, you project from the sphere’s center onto a plane tangent at a chosen point. A point on the sphere will map to the plane only if the line from the center through that point reaches the tangent plane in the forward direction. That happens precisely for the hemisphere facing the tangent plane. Points on the opposite hemisphere would project away from the tangent plane and not intersect it when traced from the center, so they aren’t represented on the finite map. The boundary where the line is parallel to the plane would require infinite distance on the plane, so those points map to infinity and cannot be shown on a finite map. Put together, the finite gnomonic map covers exactly half of the sphere—the hemisphere facing the tangent point. The other hemisphere does not appear on the finite map.

10. What is the method called when you determine the position of an unknown point by occupying points with known coordinates?

A. Resection

B. Resection, known

C. Observation

D. Intersection

This is the intersection method. You use known reference points with known coordinates to establish lines of position toward the unknown point. From each reference point you determine a line that should pass through the unknown point (by bearing, distance, or other measured data). The unknown location is found where those lines cross—the intersection. Using at least two lines makes the location unambiguous, and additional lines can improve accuracy through a least-squares adjustment. This contrasts with resections, which place you at the unknown point to measure back to known points, rather than drawing lines from known points to the unknown.

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://geodesyrefresher.examzify.com

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