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Cybersecurity Fundamentals

Exercises and practice questions

Build safer security habits while learning the foundations of threats, networks, identity, encryption, and defensive response.

Protect assets → **Reduce exposure** → **Detect + recover**

Level: Beginner · Category: Security

Original, beginner-friendly study content designed to accompany the course syllabus and its linked video lesson.

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Course purpose: Build safer security habits while learning the foundations of threats, networks, identity, encryption, and defensive response.

How to use this resource

Read the chapter titles first, then study the explanations and examples. Pause at each practice prompt before reading its suggested answer. Write down questions that remain and revisit them during revision.

Learning map



Chapter 01 · Assets, threats, and risk

Practice problem

For a personal email account, list one asset, one threat, one vulnerability, and one mitigation.

Relevant definition

An asset is something valuable to protect. A threat could cause harm by exploiting a vulnerability; risk combines likelihood and impact in a particular context.

Suggested solution

> Messages and account recovery access are assets; phishing is a threat; a reused password is a vulnerability; a unique password and multi-factor authentication reduce the risk.

Why it works

Begin with the data and services at stake, who may target them, and what controls already exist. Use layered defenses because no single control is perfect. Threat models should be updated when systems or assumptions change.

Worked reference example

A small clinic identifies patient records as a high-impact asset and maps the risk of a stolen staff laptop.

Chapter 02 · Networks and common attacks

Practice problem

List three warning signs in an unexpected login message and one safe way to check the request.

Relevant definition

A network protocol defines how devices exchange data. Attackers may exploit exposed services, weak configurations, malicious links, or human trust.

Suggested solution

> Urgent language, a mismatched sender/domain, and a shortened or unexpected link are warning signs. Navigate independently to the official service rather than using the link.

Why it works

Use secure Wi-Fi, keep software updated, and treat unexpected links and attachments cautiously. Network monitoring can reveal unusual connections, but encryption and endpoint controls also matter. Use security tools only on systems you own or are authorized to assess.

Worked reference example

A fake delivery notification asks a user to sign into a look-alike site; checking the domain and opening the carrier's official app avoids the credential trap.

Chapter 03 · Authentication and access control

Practice problem

A shared team folder exposes payroll data to every contractor. Propose a safer access model.

Relevant definition

Authentication establishes an identity; authorization decides what that identity may do. Multi-factor authentication combines different factor types.

Suggested solution

> Separate sensitive data into a restricted group, grant access only to approved roles, use individual accounts and multi-factor authentication, and review membership regularly.

Why it works

Use unique credentials, a password manager, and multi-factor authentication for important accounts. Apply least privilege: grant only the permissions needed for a task and remove access when it is no longer needed.

Worked reference example

A project collaborator receives permission to edit one repository instead of owner access to the entire organization.

Chapter 04 · Encryption and data protection

Practice problem

Distinguish encryption in transit from encryption at rest and give one example of each.

Relevant definition

Encryption transforms readable data into ciphertext using a key. In public-key cryptography, related public and private keys support secure exchange or signatures.

Suggested solution

> TLS protects traffic between browser and server in transit. Full-disk encryption protects data stored on a laptop when it is powered off or lost.

Why it works

Encryption protects confidentiality only when keys are protected and the system is used correctly. Transport encryption protects data in transit; storage encryption protects stored media. Never share secrets in source code or public messages.

Worked reference example

A browser checks a certificate and uses TLS to protect an online session from casual interception on the network.

Chapter 05 · Safe operations and incident response

Practice problem

Outline the first safe actions after clicking a suspicious attachment on a work device.

Relevant definition

Incident response is a prepared process for identifying, containing, eradicating, and recovering from a security event while preserving useful evidence.

Suggested solution

> Disconnect from the network if instructed by policy, stop entering credentials, notify the security team promptly, preserve details, and use approved recovery steps rather than deleting evidence.

Why it works

Keep software patched, backups tested, and recovery contacts current. If an account may be compromised, use a known-good device to change credentials, revoke sessions, enable stronger authentication, and report the event through a trusted channel.

Worked reference example

After finding a suspicious forwarding rule, an employee reports it, removes unauthorized access, resets credentials, and asks security staff to review sign-in records.

Summary and next steps

Cybersecurity Fundamentals brings together 5 connected topics. Review each definition, explain one example without looking, and then try the practice prompt again.

Key ideas to carry forward

Assets, threats, and risk: An asset is something valuable to protect. A threat could cause harm by exploiting a vulnerability; risk combines likelihood and impact in a particular context.

Networks and common attacks: A network protocol defines how devices exchange data. Attackers may exploit exposed services, weak configurations, malicious links, or human trust.

Authentication and access control: Authentication establishes an identity; authorization decides what that identity may do. Multi-factor authentication combines different factor types.

Encryption and data protection: Encryption transforms readable data into ciphertext using a key. In public-key cryptography, related public and private keys support secure exchange or signatures.

Safe operations and incident response: Incident response is a prepared process for identifying, containing, eradicating, and recovering from a security event while preserving useful evidence.

A short review routine

1. Recall the main idea from each chapter before rereading. 2. Work one example by hand. 3. Explain a common mistake and how you would catch it. 4. Revisit a difficult topic after a short break.

Course outcomes

- Describe assets, threats, vulnerabilities, and risk
- Recognize common network and social-engineering threats
- Apply authentication and least-privilege principles
- Explain encryption basics and safe incident response

This exercises and practice questions is an original LearnHub learning aid. Use the referenced ideas for study, then consult the course video and the rest of the library for additional practice.