

THE UNIVERSITY OF AKRON
Mathematics and Computer Science

Web and Exerquiz Packages
Test File

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Legend: In Section 5, a ✓ indicates that the student gave the correct response; a ✗, indicates an incorrect response, in this case, the correct answer is marked with a ●.

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Indholdsfortegnelse

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1. Introduction

This is a sample file to give templates of the environments defined in `exerquiz`.

2. On-Line Exercises

A well-designed sequences of exercises can be of aid to the student. The `exercise` environment makes it easy to produce electronic exercises. By using the `forpaper` option, you can also make a paper version of your exercises. See the `Webeqman.pdf` reference manual.

ØVELSE 1. Evaluate the integral $\int x^2 e^{2x} dx$.

In the preamble of this document, we defined a `problem` environment with its own counter. Here is an example of it.

Problem 2.1. Is $F(t) = \sin(t)$ an antiderivative of $f(x) = \cos(x)$? Explain your reasoning.

Problem 2.2. Is $F(t) = \sin(t)$ an antiderivative of $f(x) = \cos(x)$? Explain your reasoning.

By modifying the `exercise` environment, you can also create an `example` environment. The one defined in the preamble of this document has no associated counter.

Example. Give an example of a set that is *clopen*.

Løsning: The real number line is both closed and open in the usual topology of the real line. \square

There is a `*`-option with the `exercise` environment, using it signals the presence of a multiple part exercise question. The following exercise illustrates this option.

ØVELSE 2. Suppose a particle is moving along the s -axis, and that its position at any time t is given by $s = t^2 - 5t + 1$.

- (a) Find the velocity, v , of the particle at any time t .
- (b) Find the acceleration, a , of the particle at any time t .

References can be made to a particular part of an exercise; for example, “see [Exercise 2\(a\)](#).” Part (a) is in [blue](#); the solutions for that part is “hidden”. This is a new option for the `exercise` environment.

There is now an option for listing multipart question in tabular form. This problem style does not obey the `solutionsafter` option.

ØVELSE 3. Simplify each of the following expressions in the complex number system. *Note:* \bar{z} is the conjugate of z ; $\operatorname{Re} z$ is the real part of z and $\operatorname{Im} z$ is the imaginary part of z .

(a) i^2

(b) i^3

(c) $z + \bar{z}$

(d) $1/z$

3. Short Quizzes with or without Solutions

Below is a `shortquiz` without solution.

Opgave. Was it in Xanadu did Kubla Kahn a stately pleasure dome decree?

(a) True

(b) False

Below is a `shortquiz` with a solution.

Opgave. In what year did Columbus sail the ocean blue?

(a) 1490

(b) 1491

(c) 1492

(d) 1493

These two types can be bundled together using the `questions` environment.

Opgave. Answer each of the following. Passing is 100%.

1. Was it in Xanadu did Kubla Kahn a stately pleasure dome decree?
(a) True (b) False
2. In what year did Columbus sail the ocean blue?
(a) 1490 (b) 1491 (c) 1492 (d) 1493

Try using the `proofing` option of `exerquiz`. In this case, the correct answer is indicated to the side; useful, perhaps, for proof-reading the document

4. Graded Quizzes with JavaScript

You can create graded quizzes using the `quiz` environment.

Here is a graded quiz using simple links. Might be suitable for a limited number of questions.

Start opgaver Using the discriminant, $b^2 - 4ac$, respond to each of the following questions.

1. Is the quadratic polynomial $x^2 - 4x + 3$ irreducible?
(a) Yes (b) No
2. Is the quadratic polynomial $2x^2 - 4x + 3$ irreducible?
(a) Yes (b) No
3. How many solutions does the equation $2x^2 - 3x - 2 = 0$ have?
(a) none (b) one (c) two

Slut

By using the *-option, you can create a multiple choice set of question using check boxes.

Start opgaver Using the discriminant, $b^2 - 4ac$, respond to each of the following questions.

1. Is the quadratic polynomial $x^2 - 4x + 3$ irreducible?

Yes

No

2. Is the quadratic polynomial $2x^2 - 4x + 3$ irreducible?
Yes No
3. How many solutions does the equation $2x^2 - 3x - 2 = 0$ have?
none one two

Slut

The `proofing` option of `exerquiz` can be used to mark the correct answer to the side; useful, perhaps, for proof-reading the document

5. Correcting Quizzes with JavaScript

Beginning with version 1.2 of `exerquiz`, you can now grade the quizzes created by the `quiz` environment. In this section, we illustrate the `quiz` environment with corrections.

There are two types: link-style and form-style. This is the link-style format:

Start opgaver Answer each of the following. Passing is 100%.

1. Who created T_EX?

- (a) Knuth (b) Lamport (c) Carlisle (d) Rahtz

2. Who originally wrote L^AT_EX?

- (a) Knuth (b) Lamport (c) Carlisle (d) Rahtz

Slut

We can obtain the forms-style quiz simply by inserting an ***** before the quiz field name. **Important!** Be sure to name each quiz field differently!

Start opgaver Answer each of the following. Passing is 100%.

1. Who created T_EX?

- Knuth Lamport Carlisle Rahtz

2. Who originally wrote L^AT_EX?

- Knuth Lamport Carlisle Rahtz

Slut

The “corrections” button can be modified to suite your needs. The quiz below queries your knowledge of the people who maintain various freeware T_EX Systems for UNIX and Win95/98/NT. The corrections button has been modified to take on a different look.

Start opgaver Answer each of the following. Passing is 100%.

1. What T_EX System does Thomas Esser maintain?

MikT_EX csT_EX teT_EX fpT_EX

2. What T_EX System does Fabrice Popineau maintain?

MikT_EX csT_EX teT_EX fpT_EX

3. What T_EX System does Christian Schenk maintain?

MikT_EX csT_EX teT_EX fpT_EX

Slut

6. Objective-Style Questions

Beginning with version 2 of Exerquiz, it is possible to pose objective-style questions (fill-in-the-blank). The demo file for this style question is called [jqiztst.pdf](#) (relative link: [jqiztst.pdf](#)). Click on the link to review this demo file.

Løsning på øvelserne


Øvelse 1. We evaluate by integration by parts:

$$\begin{aligned}\int x^2 e^{2x} dx &= \frac{1}{2}x^2 e^{2x} - \int x e^{2x} dx && u = x^2, dv = e^{2x} dx \\ &= \frac{1}{2}x^2 e^{2x} - \left[\frac{1}{2}x e^{2x} - \int \frac{1}{2}e^{2x} dx \right] && \text{integration by parts} \\ &= \frac{1}{2}x^2 e^{2x} - \frac{1}{2}x e^{2x} + \frac{1}{2} \int e^{2x} dx && u = x^2, dv = e^{2x} dx \\ &= \frac{1}{2}x^2 e^{2x} - \frac{1}{2}x e^{2x} + \frac{1}{4}e^{2x} && \text{integration by parts} \\ &= \frac{1}{4}(2x^2 - 2x + 1)e^{2x} && \text{simplify!}\end{aligned}$$

Øvelse 1


Problem 2.1. The answer is yes. The definition states that F is an antiderivative of f if $F'(x) = f(x)$. Note that

$$F(t) = \sin(t) \implies F'(t) = \cos(t)$$

hence, $F(x) = \cos(x) = f(x)$. 

Problem 2.2. The answer is yes. The definition states that F is an antiderivative of f if $F'(x) = f(x)$. Note that

$$F(t) = \sin(t) \implies F'(t) = \cos(t)$$

hence, $F(x) = \cos(x) = f(x)$. 

Øvelse 2(b) Acceleration is the rate of change of velocity with respect to time. Thus,

$$a = \frac{dv}{dt}$$

For our problem, we have

$$a = \frac{dv}{dt} = \frac{d}{dt}(2t - 5) = 2.$$

The acceleration at time t is constant: $a = 2$.



Øvelse 3(a) $i^2 = -1$



Øvelse 3(b) $i^3 = ii^2 = -i$



Øvelse 3(c) $z + \bar{z} = \operatorname{Re} z$



Løsning på opgaverne

Løsning på opgave:

In 1492,
Columbus sailed the ocean blue.
Profound was the logic in his quest,
to get to the east, he headed west.¹

Slut

¹This poem was obtained by personal communication from Leonard A. Stefanski, Department of Statistics, North Carolina State University.

Løsning på opgave:

In 1492,
Columbus sailed the ocean blue.
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