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 ●.

Répertoire

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Table des matières

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.

EXERCICE 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*.

Solution : The real number line is both closed and open in the usual topology of the real line. □

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.

EXERCICE 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.

EXERCICE 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.

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

(a) True (b) False

Below is a `shortquiz` with a solution.

Question. 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.

Question. 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.

Début 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

Fin

Score :

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

Début 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

Fin Score :

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:

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

1. Who created TEX?

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

2. Who originally wrote LATEX?

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

Fin

Score : Réponses

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!

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

1. Who created TEX?

☐ Knuth ☐ Lamport ☐ Carlisle ☐ Rahtz

2. Who originally wrote LATEX?

☐ Knuth ☐ Lamport ☐ Carlisle ☐ Rahtz

Fin Score : Réponses

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

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

1. What TEX System does Thomas Esser maintain?

☐ MikTEX ☐ csTEX ☐ teTEX ☐ fpTEX

2. What TEX System does Fabrice Popineau maintain?

☐ MikTEX ☐ csTEX ☐ teTEX ☐ fpTEX

3. What TEX System does Christian Schenk maintain?

☐ MikTEX ☐ csTEX ☐ teTEX ☐ fpTEX

Fin Score : TeX

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 jquiztst.pdf (relative link: jquiztst.pdf). Click on the link to review this demo file.

Solutions des Exercices

Exercice 1. We evaluate by `integration by parts`:

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

Exercice 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, $F(x) = \cos(x) = f(x)$. ◀

Exercice 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: $\boxed{a = 2}$. □

Exercice 3(a) $i^2 = -1$ □

Exercice 3(b) $i^3 = ii^2 = -i$ □

Exercice 3(c) $z + \bar{z} = \mathrm{Re}\, z$ □

Les réponses aux questionnaires

Réponse :

In 1492,
Columbus sailed the ocean blue.

Profound was the logic in his quest,
to get to the east, he headed west.[1]

Retour au questionnaire.

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

Réponse :

In 1492,
Columbus sailed the ocean blue.

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