

THE UNIVERSITY OF AKRON
Mathematics and Computer Science

Web and Exerquiz Packages
Test File

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1. Введение

Это - пробный файл шаблонов окружений, определенных в `exerciiz`.

2. Интерактивные упражнения

Талантливо задуманная последовательность упражнений может помочь студенту. Окружение `exercise` облегчает изготовление электронных упражнений. Используя опцию `forpaper`, Вы также можете сделать бумажную копию Ваших упражнений. См. справочное руководство `Webeqman.pdf`.

УПРАЖНЕНИЕ 1. Вычислить интеграл $\int x^2 e^{2x} dx$.

В преамбуле этого документа мы определили окружение `problem` со своим собственным счетчиком. Вот его пример.

Задача 2.1. Является ли $F(t) = \sin(t)$ первообразной $f(x) = \cos(x)$? Поясните свой вывод.

Модифицируя окружение `exercise`, Вы можете также создать окружение `example`. В преамбуле этого документа оно определено без сопутствующего счетчика.

Пример. Приведите пример *открыто-замкнутого* множества.

Решение: Вещественная ось одновременно открыта и замкнута в топологии вещественной оси.

□

Существует ***-разновидность окружения `exercise`, Ее использование сигнализирует о присутствии нескольких частичных вопросов упражнения. Следующие упражнения иллюстрируют опцию.

УПРАЖНЕНИЕ 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.

УПРАЖНЕНИЕ 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. Короткие тесты с ответами и без ответов

Below is a **shortquiz** without solution.

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

(a) True

(b) False

Below is a **shortquiz** with a solution. **Вопрос** In what year did Colum-

bus sail the ocean blue?

- (a) 1490 (b) 1491 (c) 1492 (d) 1493

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

Вопрос 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. Подводящие итог тесты на основе 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.

СТАРТ! 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

ИТОГО:

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

СТАРТ! 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

ИТОГО:

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

5. Исправляющие тесты на основе 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:

СТАРТ! 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

ИТОГО:

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!

СТАРТ! 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

ИТОГО:

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.

СТАРТ! 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

ИТОГО:

Решения упражнений


К упражнению 1. Мы используем интегрирование по частям:

$$\begin{aligned} \int x^2 e^{2x} dx &= \frac{1}{2} x^2 e^{2x} - \int x e^{2x} dx && u = x^2, dv = e^{2x} dx \\ &= \frac{1}{2} x^2 e^{2x} - \left[\frac{1}{2} x e^{2x} - \int \frac{1}{2} e^{2x} dx \right] && \text{интегрирование по частям} \\ &= \frac{1}{2} x^2 e^{2x} - \frac{1}{2} x e^{2x} + \frac{1}{2} \int e^{2x} dx && u = x^2, dv = e^{2x} dx \\ &= \frac{1}{2} x^2 e^{2x} - \frac{1}{2} x e^{2x} + \frac{1}{4} e^{2x} && \text{интегрирование по частям} \\ &= \frac{1}{4} (2x^2 - 2x + 1) e^{2x} && \text{Просто!} \end{aligned}$$

К упражнению 1

Упражнение 2.1. Ответ — да. Определение утверждает, что F есть первообразная функции f если $F'(x) = f(x)$. Заметим, что

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

Таким образом, $F(x) = \cos(x) = f(x)$. 

К упражнению 2(б) 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: $a = 2$.



К упражнению 3(а) $i^2 = -1$



К упражнению 3(b) $i^3 = ii^2 = -i$



К упражнению 3(с) $z + \bar{z} = \operatorname{Re} z$



Ответы к тестам

Ответ:

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

К формулировке вопроса

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

Ответ:

In 1492,
Columbus sailed the ocean blue.
Profound was the logic in his quest,
to get to the east, he headed west.²

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