Exam

Comment

This document contains the basic structure of an *Exam Builder* template file, and is intended for use as a guide when creating new such files. This type of file can be used in conjunction with *Scientific WorkPlace* or *Scientific Notebook* to generate algorithmically defined exams, quizzes and problem sets. An *Exam Builder* quiz can be taken and graded online; or a printed quiz, along with associated answer key and solutions file can be created. Use this file as a guide when creating your own *Exam Builder* template file. Refer to the Help files for detailed information about developing quizzes using *Exam Builder.*

Replace the name input box and label in the Text section below with the following two lines if you intend to generate a printed quiz rather than an on-screen quiz.

Algebra and Calculus Practice Test

Name _____

Period _____

Text

Name

Algebra and Calculus Practice Quiz

Setup

Title: Algebra and Calculus Practice Quiz

Submit: Click here to submit

Part

Comment

The first part of this sample quiz will test knowledge of elementary equations

Text

Algebra - First, some warm-up exercises.

Setup

Choice Space: 4

Choices: No Break, Radio Buttons, Permute

Question Space: 6

Question

Comment

Comments aren't necessary, but may be helpful to the composer of the exam.

Setup

$a := \text{rand}(-10, 10)$

$b := \text{rand}(1, 10)$

$x = -b/a$

Conditions: $(ab \neq 0) \wedge (a \neq b) \wedge (a \neq -b)$

Statement

Solve the equation $b + Xa = 0$.

Choices

- $-\frac{1}{x}$
- $-x$
- $\frac{1}{x}$
- x

Fixed None of the above

Answer

The correct solution is x.

Solution

$b + Xa = 0$

Subtract b from both sides of the equation.

$b + Xa - b = 0 - b$

$Xa = -b$

Divide both sides of the equation by b.

$X = \frac{-b}{a} = x$

Question

Setup

$a := \text{rand}(-10, 10)$

$b := \text{rand}(-10, 10)$

$x = b/a$

Conditions: $(ab \neq 0) \wedge (a \neq b) \wedge (a \neq -b)$

Statement

Solve the equation $Xa = b$.

Choices

- $-\frac{1}{x}$
- $-x$
- $\frac{1}{x}$
- x

Fixed None of the above

Answer

The correct solution to the equation is x.

Solution

$Xa = b$

Divide both sides of the equation by a.

$\frac{Xa}{a} = \frac{b}{a} = x$

Part

Comment

Now that the student has been warmed up...

Text

Calculus - A 2nd Semester Calculus problem.

Question

Setup

$a := \text{rand}(1,4)$

Statement

Find the centroid of the region in the first quadrant bounded by the axes and the curve $y = a^2 - x^2$.

Choices

- $(\frac{3}{8}a, \frac{2}{5}a)$
- $(\frac{1}{2}a, \frac{1}{2}a^2)$
- $(\frac{1}{2}a, \frac{2}{5}a)$
- $(\frac{3}{8}a, \frac{1}{2}a^2)$

Answer

$(\frac{3}{8}a, \frac{2}{5}a)$

Solution

The curve intersects the axes at $(0, a^2)$and $(a, 0)$.

The area of the enclosed region is $A = \int_0^a a^2 - x^2 dx = \frac{2}{3}a^3$

Then $\bar{x} = \frac{\int xdA}{A} = \frac{\int_0^a x(a^2-x^2)dx}{\frac{2}{3}a^3} = \frac{\frac{1}{4}a^4}{\frac{2}{3}a^3} = \frac{3}{8}a$

And $\bar{y} = \frac{\int ydA}{A} = \frac{\int_0^{a^2} y\sqrt{a^2-y}\,dy}{\frac{2}{3}a^3} = \frac{\int_0^{a^2} y\sqrt{a^2-y}\,dy}{\frac{2}{3}a^3} = \frac{2}{5}a^2$