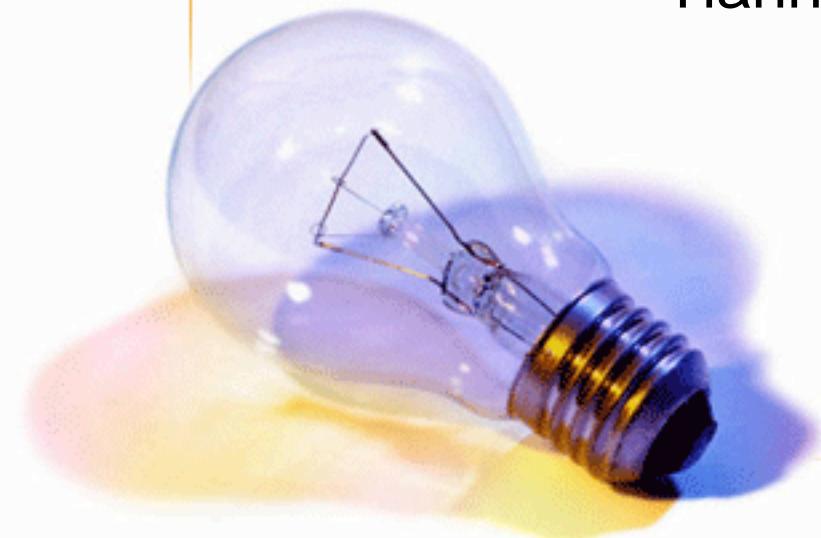




Yiannis Arapoglou - Vasilis Palilis

<https://stem.widetraining.gr/>





STEM teaching using Moodle

The course could have the detailed title “ STEM teaching using Moodle”. We have installed almost all of the Moodle - plugins associated with these subjects and we have searched to find and "upload" resources and activities that serve them.

- Core Moodle recourses
- Core Moodle activities
- Moodle plugins
- Html code

<https://stem.widetraining.gr/>

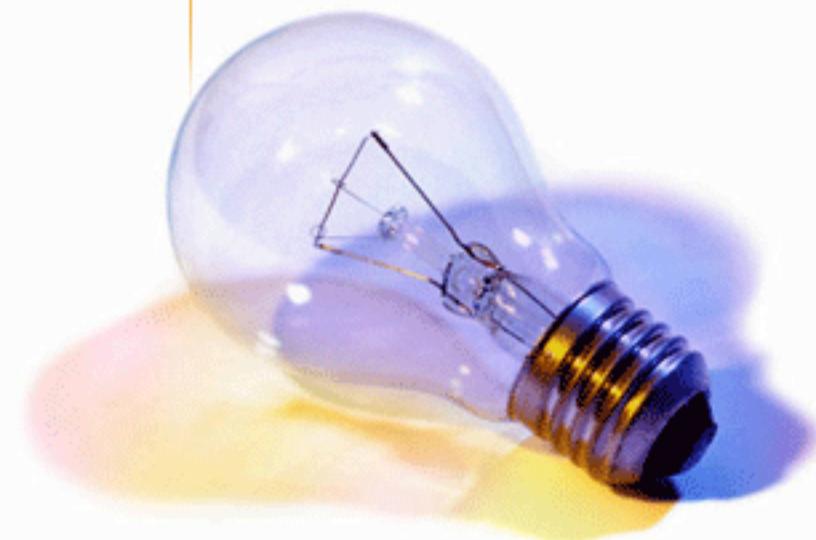


Contents

The contents of the course are categorized as follows:

- Notation and editors
- Moodle Activities & Resources
- Quiz activity
- Entertainment! (We refer to Games plugin)
- Geogebra (We refer to the corresponding plugin)
- Formulas questions (We refer to the corresponding plugin)
- Wiris questions (CAS) (We refer to the corresponding plugin)

Notation and editors





Writing maths using TeX notation

https://docs.moodle.org/en/Using_TeX_Notation

How do we write the fraction "three fourth" using TeX notation? We copy something like [that](#) and ... modify it: Πώς γράφουμε το κλάσμα "τρία τέταρτα" με TeX notation? Αντιγράφουμε κάπι παρόμοιο ... και το τροποποιούμε:

\$\$ \backslashfrac{numerator}{denominator} \$\$

\$\$ \backslashfrac{3}{4} \$\$

$\frac{3}{4}$

Save changes

Cancel

<https://youtu.be/-pj-pr8xTps>



Writing maths using TeX in Atto Equation editor

https://docs.moodle.org/en/Text_editor



The screenshot shows the Atto Equation editor window. At the top, there are tabs for Operators, Arrows, Greek Symbols, and Advanced. The Advanced tab is selected. Below the tabs is a grid of mathematical symbols and operators. A hand cursor is hovering over the symbol for a 2x2 matrix. To the right of the grid is a preview area showing the rendered TeX code and its visual representation as a fraction $\frac{3}{4}$.

Operators Arrows Greek Symbols Advanced

$\sum a, b$ $\sqrt[b+c]{c}$ $\int_a^b c$ $\iint_a^b c$ $\iiint_a^b c$ $\oint a$ (a)
 $[a]$ $\{a\}$ $| a_1 \quad a_2 \quad a_3 \quad a_4 |$ $\begin{matrix} a \\ b \end{matrix}$ \vec{a} $\left(\begin{matrix} a \\ b \end{matrix}\right)$
 $\begin{bmatrix} a \\ b \end{bmatrix}$ $\left\{\begin{matrix} a \\ b \end{matrix}\right\}$

Edit equation using TeX

```
\frac{a}{b+c}
```

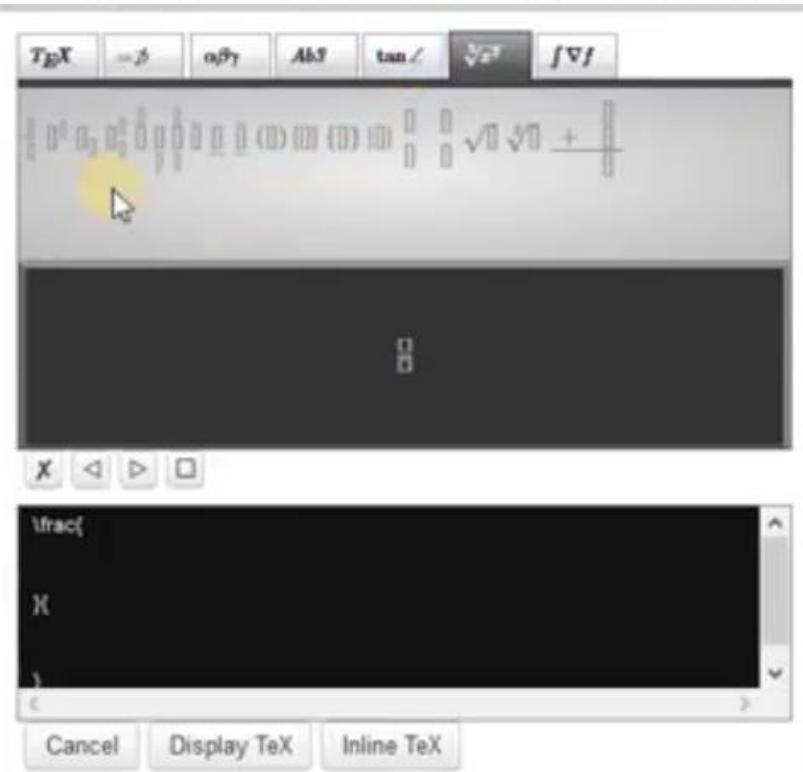
$$\frac{3}{4}$$

<https://youtu.be/rwhdnicTPqs>



Writing maths using TeX in Atto Mathslate editor

https://moodle.org/plugins/atto_mathslate



$$\frac{3}{4}$$

<https://youtu.be/XEUsWFYVmCk>



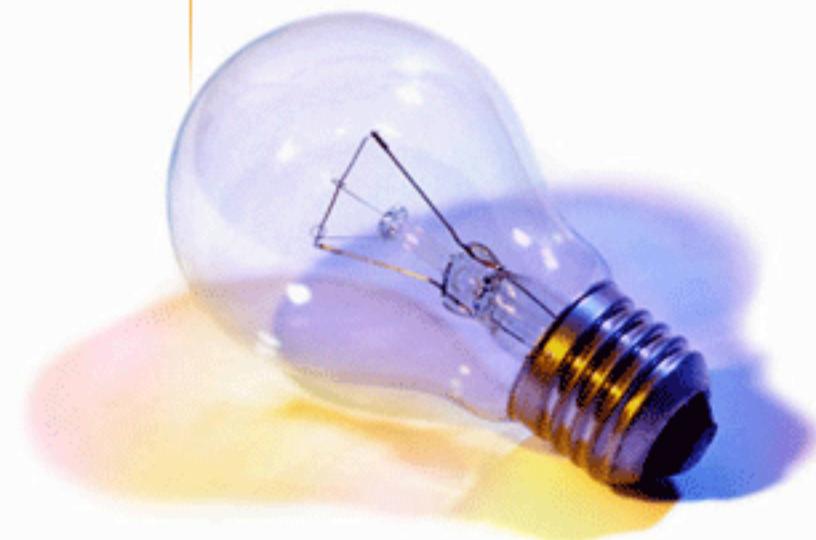
Writing maths in Wiris editor

https://moodle.org/plugins/atto_wiris



<https://youtu.be/gePnH6PFhW4>

Chemistry notation



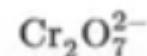


Writing Dichromate anion using mhchem notation

https://docs.moodle.org/en/Chemistry_notation_using_mhchem



How do we write the Dichromate anion using mhchem notation? We copy something like **that** and ... modify it: Πώς γράφουμε το Διχρωμικό ανιόν με mhchem notation? Αντιγράφουμε κάτι **παρόμοιο** ... και το τροποποιούμε:



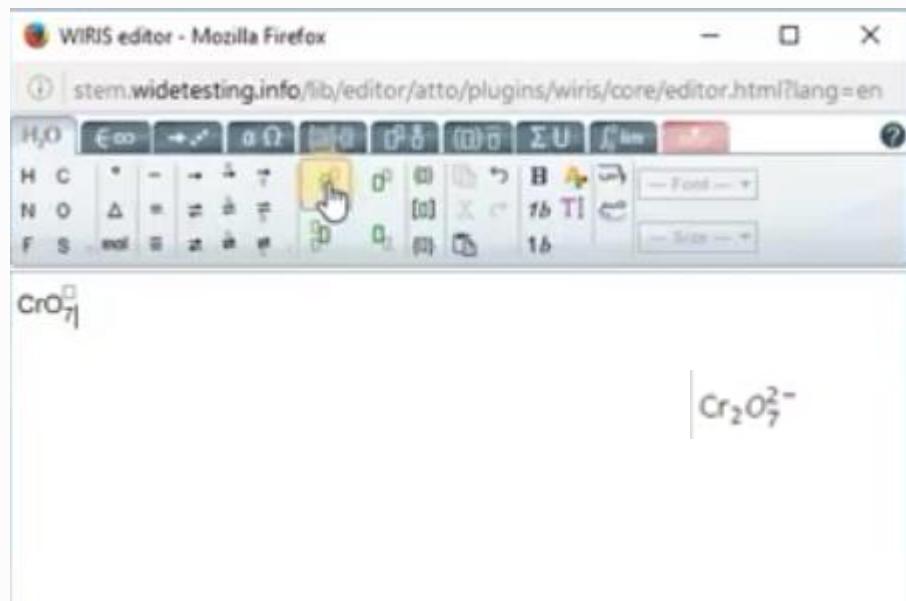
`\(\\text{Cr}_2\\text{O}_7^{2-})\\)`

<https://youtu.be/aGMgZJy85yE>



Writing Dichromate anion using Wiris chemistry editor

https://moodle.org/plugins/atto_wiris



<https://youtu.be/jGXy43pykUg>

Moodle resources and activities



Assignment with Rubric and PHET simulation

<https://phet.colorado.edu/>

The screenshot shows the PhET Density Lab simulation interface. At the top, there are buttons for "My Block" (unchecked) and "Material" (checked), with a dropdown menu set to "Wood". Below this, there are three sliders: "Mass" (set to 2.00), "Volume" (set to 5.00), and "Density" (set to 0.40 kg/L). A red arrow points to the density value. In the center, a 3D wooden block is shown with a mass of 2.00 kg labeled below it. To the right, a digital notebook page displays the calculation $\frac{2\text{kg}}{5\text{L}} = 0.4\text{kg/L}$ and the result 1000kg/m^3 . A blue bar at the bottom indicates a total volume of 102.00 L. On the right side of the screen, a rubric table for density calculations is overlaid:

EXPLANATION	0 points	WITHOUT EXPLANATION	WITH EXPLANATION
Density calculation	Wrong calculation 0 points	Wrong calculation without or with wrong unit 1 points	Wrong calculation, wrong unit 2 points
Units	Wrong in S.I. 0 points	Wrong S.I. units without explanation 1 points	Wrong S.I. units, right explanation 2 points

Sunday, 14 August 2016, 4:47 PM
Comments (0)

https://youtu.be/GWhpRc4B7_k



Lesson activity, question page

<https://phet.colorado.edu/>

The simulation interface includes:

- Solution Settings:** Acid/Base toggle, Initial Concentration (mol/L) slider from 0.001 to 1.0, Strength slider from weaker to strong.
- Views:** Molecules (selected), Solvent, Graph, Hide Views.
- Tools:** Pipette, Test Tube, Lightbulb.
- Chemical Reaction:** $\text{HA} + \text{H}_2\text{O} \rightleftharpoons \text{A}^- + \text{H}_3\text{O}^+$
- Question:** What is the pH of a strong acid solution with initial concentration 0.010 mol/L?
- Run Simulation:** Click to Run button.
- Score:** 11 / 3.

<https://youtu.be/kA9-mxViiw>

<https://youtu.be/-vSWWnflJuU>



External tool, Chemvantage Quiz

https://docs.moodle.org/en/LTI_and_Moodle

1. What is the oxidation number of nitrogen in NO_3^- (aq)?

Enter the correct numerical value to 1.0% precision. Express scientific notation like 4.29E-15

5

2. When aqueous solutions of CaBr_2 and NH_4OH are mixed, what happens?

Select only the best answer:

- no reaction
- $\text{Ca}(\text{OH})_2$ precipitates
- NH_4Br precipitates
- $\text{Ca}(\text{NH}_4)_2$ precipitates
- BrOH precipitates

3. The number of hydrogen atoms in the formula unit for sodium bicarbonate is

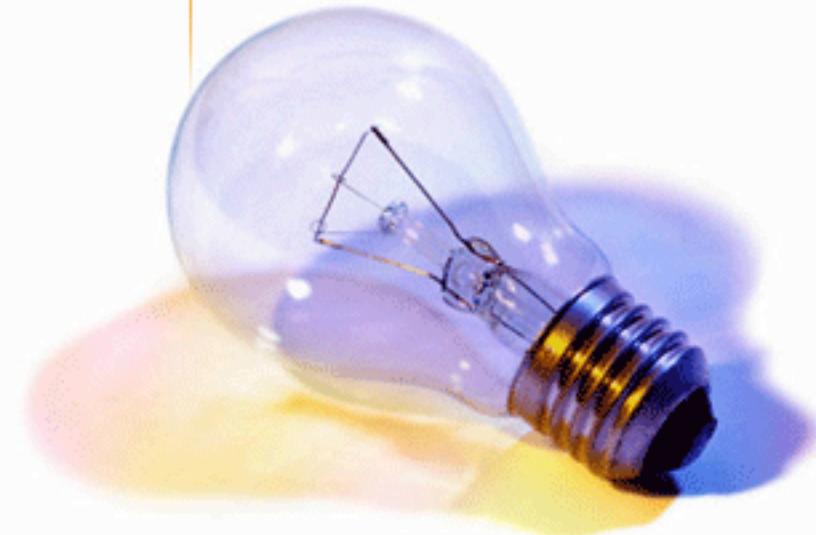
Enter the correct numerical value to 1.0% precision. Express scientific notation like 4.29E-15

1

Moodle quiz

Moodle question bank

Simple questions





True False question type

True/False question type

1 kg Cotton will weigh more than 1 kg Iron.

<h5>True/ False question type</h5>

Heading tag Line break tag

 1 kg Cotton
will weigh more than 1 kg Iron

 Λογικά ένα
κιλό (1 kg) βαμβάκι είναι πιο «βαρύ», από ένα
κιλό (1 kg) σίδηρο.

Multi la: Select one:

True 

False

A given volume of iron will weigh more than the same volume of cotton.!

The weight of a body is proportional to its mass. So, bodies with equal masses have equal weights.

<https://youtu.be/gAsXOHSwI9c>

Short Answer question type



Preview question: Short-A...

stem.widetesting.info/question/pn

Search

Question 1
Not yet answered
Marked out of 1.00

Short-Answer question type

Πα γράψτε όλους τους διμήνιους αριθμούς που περιέχουν το μηνίο Οκτώβριος σε φθίνουσα σειρά, χρησιμοποιώντας το κατάλληλο σύμβολο της αναστοίτας ανάμεσα των.
Πρόσωπο: Μην αφήνετε κενά πληκτρολογώντας.
Για παράδειγμα: 15>14 και Οχι 15 > 14!

Answer: 10>20>30>40>50>60>70>80>90

Start again Save Fill in correct responses Submit and finish Close preview

Technical information ⓘ>

- Attempt options

Answer 2 10>20>30>40>50>60>70>80>90 Grade None

Feedback

The order is not descending, the inequality symbol is not correct! Η σειρά δεν είναι φθίνουσα, το σύμβολο ανισότητας δεν είναι το σωστό!

<https://youtu.be/aAsXQHsW19c>

Multiple choice one answer question type

Select one:

66%

70% ✗ You probably included the percentage of the surface which has an altitude between 2 km and 3 km.
Have you take into account that there are negative altitudes?

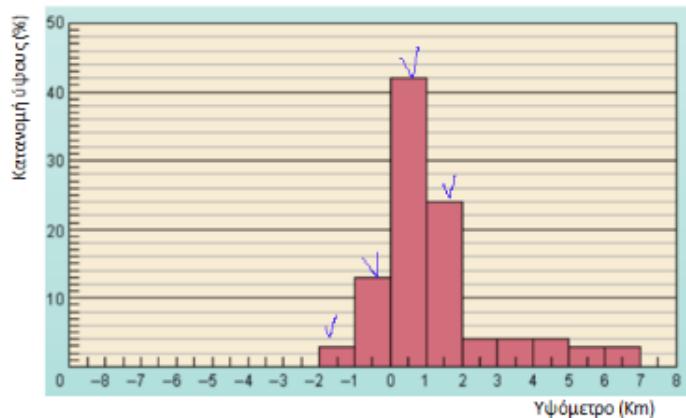
82%

Κανένα από αυτά.

Η απάντηση δεν είναι σωστή

$$3\% + 13\% + 42\% + 24\% = 82\% \text{ ή } 100\% - (2 \cdot 3\% + 3 \cdot 4\%) = 82\%$$

The correct answer is: 82%



<https://youtu.be/h2oUvBvGn1g>



Multiple choice multiple answers question type

Question 1

Not yet answered

Marked out of 1.00

Multiple Choice question type

Select the sentences that you think they are CORRECT.

If you select a wrong one you lose points!

If you divide a piece of plasticine into two equal pieces, then each of the pieces obtained will have:

Select one or more:

- 1. Less mass than the mass of the original piece. ✓
- 2. Volume smaller than the volume of the original piece.. ✓
- 3. Lower density than the density of the original piece. ✗ The density of a material does not depend on mass and volume. It has the same value.

Your answer is partially correct.

You have selected too many options.

- You have divide the piece of plasticine into two equal pieces! Therefore, they have smaller volume and mass than the original piece.
- Since it is the same material density is the same.

The correct answer is: Less mass than the mass of the original piece., Volume smaller than the volume of the original piece..

<https://youtu.be/slKWH003Y>



Matching question type

Question 1

Not answered

Marked out of 1.00

Matching question type

The different states of matter.

Match:



Liquid



Gas



Solid



<https://youtu.be/vZr7uDHPacw>



Numerical question type

https://docs.moodle.org/en/Numerical_question_type

The gravitational constant, denoted by the letter G, is an empirical physical constant involved in the calculation of gravitational effects.

Its value is approximately $G = 6.674 \cdot 10^{-11} \frac{N \cdot m^2}{kg^2}$

The error in this question is $1 \cdot 10^{-14}$.

Fill the text box with an acceptable number and the unit of the constant.

Answer:



Answer 1

6.674E-11

Error 1.0E-14



Ok!!!

$6.673\dots 6.675 \cdot 10^{-11} Nm^2kg^{-2}$ (Nm^2/kg^2)

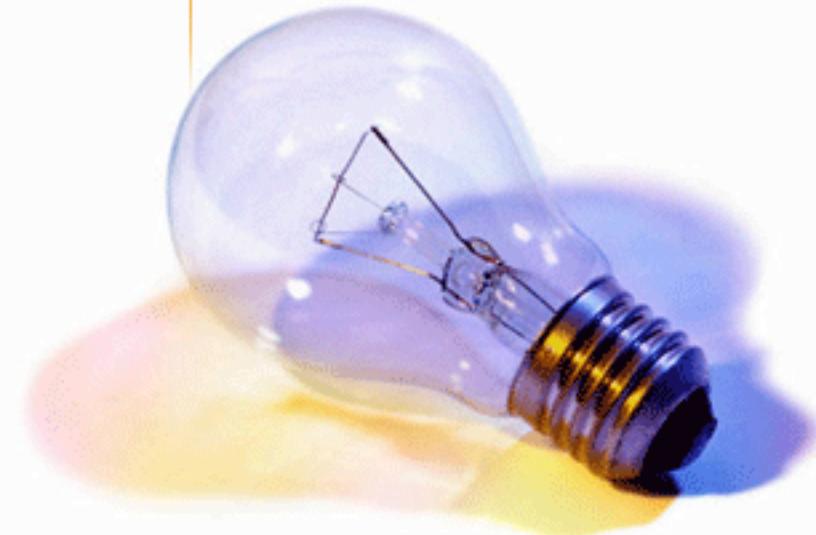
The correct answer is: 6.674E-11 Nm^2kg^-2

<https://youtu.be/w0mYQ5FSqIA>

Moodle question bank

Complex

questions





Embedded answers Cloze question

[https://docs.moodle.org/en/Embedded_Answers_\(Cloze\)_question_type](https://docs.moodle.org/en/Embedded_Answers_(Cloze)_question_type)

Embedded answers (Cloze) question

To construct the graph of a secondary function, the parable, the following method is proposed:

We find the symmetry axis

We find the top

We find the intersection points with the two axes.

We design the line

Let's apply these to the construction of the parabola

$$y = x^2 + 2x - 3$$

The symmetry axis is the line (ε) : $\boxed{\quad} = -\frac{\beta}{2\alpha} = \boxed{\quad}$

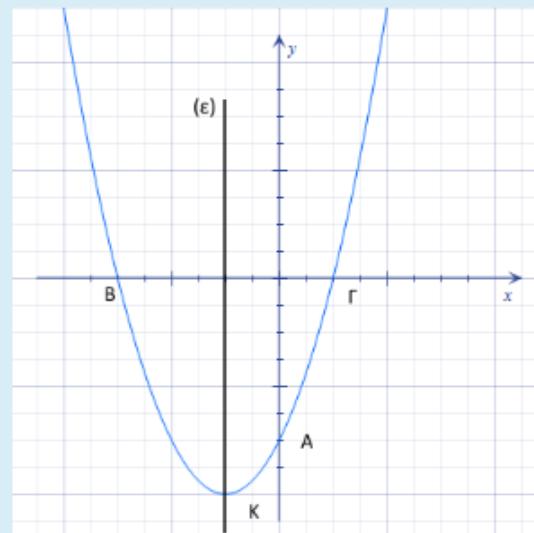
Its peak is the point $K\left(-\frac{\beta}{2\alpha}, -\frac{\Delta}{4\alpha}\right) = (\boxed{\quad}, \boxed{\quad})$

Intersects the axis y' at point $A(\boxed{\quad}, \boxed{\quad})$

Intersects the negative semi axis to point $B(\boxed{\quad}, \boxed{\quad})$,

$(\boxed{\quad})$ and the positive to point $\Gamma(\boxed{\quad}, \boxed{\quad})$.

Enter only numbers and without spaces between them!



<https://youtu.be/gbM5poCrKw0>



Select missing words question type

https://docs.moodle.org/en>Select_missing_words_question_type

State whether the phrases are right or wrong

If the phrase is wrong/false select "0", otherwise select "1"

1. Identity is an equality containing variables and is verified for some values of these variables:
2. Identity is an equality containing variables and is verified for all values of these variables:
3. The equality $x^2 + \psi^2 - 2x\psi = (x - \psi)^2$ is not an identity:
4. If $\alpha + \beta = 5$ then $\alpha^2 + 2\alpha\beta + \beta^2 = 25$:

Να κάνεις τις πρόσθιες. Σύρε σωστά, ανάλογα με τα χρώματα (η πρώτη και η τέταρτη ερώτηση έχουν απόντηση στο λευκό χρώμα):

$\$ \$ \left(\frac{3}{2} \right) ^{-2} = [[4]]$
 $\$ \$ \left(\left(-2 \right) ^0 \right) ^3 = [[?]]$
 $\$ \$ \left(2^4 \right) ^{-1} = [[10]]$
 $\$ \$ \left(- \frac{2}{3} \right) ^{12} \cdot \left(\frac{2}{3} \right) ^{-14} = [[2]]$
 $\$ \$ 4^{12} : 2^{20} = [[9]]$
 $\$ \$ 0,01^3 : 10^5 = [[14]]$

I

<https://youtu.be/9g2E0hupLOI>

Drag and drop into text question type

https://docs.moodle.org/en/Drag_and_drop_into_text_question_type

The screenshot shows a Moodle question preview window titled "Preview question: 103_dinamiaplespraxeis". The question number is 2, and the mark is 0.51 out of 1.00. The question text is in Greek: "Θε κάνεις τη μόδης. Σύρε στον αντίκειμα που το ρυθμίζει (η μόδα ή η τάση) σώματα σαν αυτά (στα δύο γραμμές)". Below the text are six mathematical expressions for the student to drag and drop into boxes:

- $\left(\frac{1}{2}\right)^{-2} = \boxed{\frac{1}{4}}$ (Correct)
- $\left[1 - 2^2\right]^3 = \boxed{125}$ (Incorrect)
- $\left(2^4\right)^{-1} = \boxed{\frac{1}{16}}$ (Correct)
- $\left(-\frac{1}{2}\right)^{12} \left(\frac{1}{2}\right)^{-12} = \boxed{\frac{1}{2}}$ (Correct)
- $4^{17} \cdot 2^{19} = \boxed{16}$ (Incorrect)
- $(0,01)^2 \cdot 10^5 = \boxed{100}$ (Incorrect)

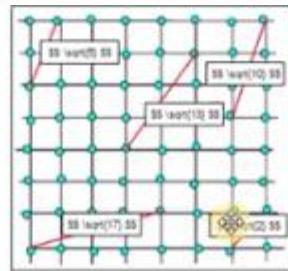
A yellow cursor arrow is pointing at the last expression. At the bottom left of the window, there is a small icon with the number 18 and the text "Επόμενη σελίδα".

<https://youtu.be/YHPWVbeTbyM>



Drag and drop onto image question type

https://docs.moodle.org/en/Drag_and_drop_onto_image_question_type

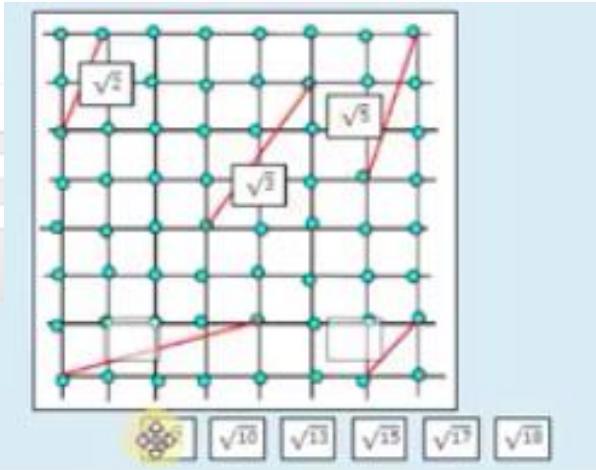


- Draggable items

Shuffle drag items each time question is attempted

Draggable item 1

Type: Draggable text
Group: 1
 Infinite
Text:



<https://youtu.be/w50hA4On1g0>

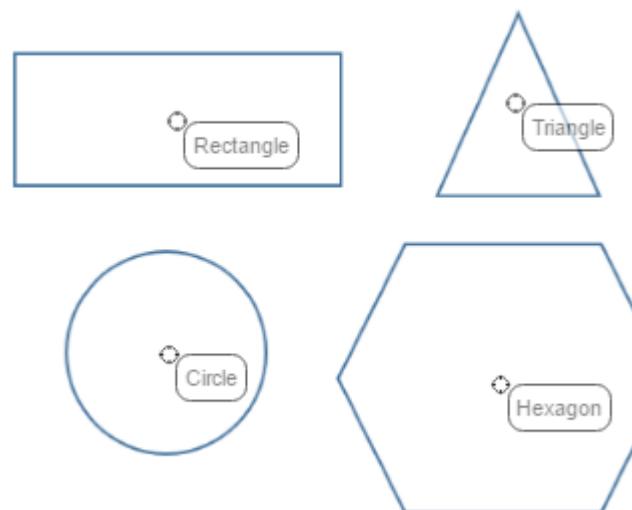
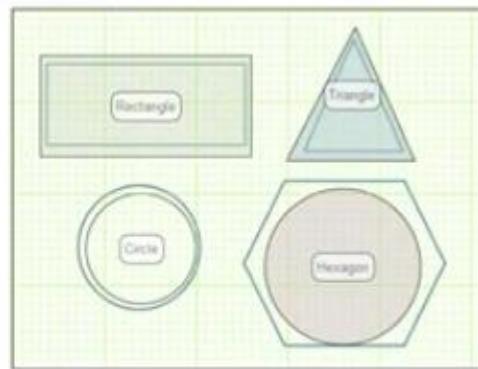


Drag and drop markers question type

https://docs.moodle.org/en/Drag_and_drop_markers_question_type

› Markers

› Drop zones



<https://youtu.be/KTCmySWIxZOk>



Pattern match question

<http://www.open.edu/openlearncreate/mod/oucontent/view.php?id=52747§ion=2.2.1>

Preview question: Pattern-match question

Ερώτηση 1
Correlation
Mark 1.00 out of 1.00

Pattern-match question type Test this question

Στην εικόνα διέλεγεται το λάδι επικάλεση στο νερό.

Εξηγήστε σύστημα το γιατί. Μη χρησιμοποιήστε περισσότερες από 20 λέξεις.
ΑΠΑΝΤΗΣΤΕ ΜΕ ΚΕΦΑΛΑΙΑ ΓΡΑΜΜΑΤΑ.

Answer:





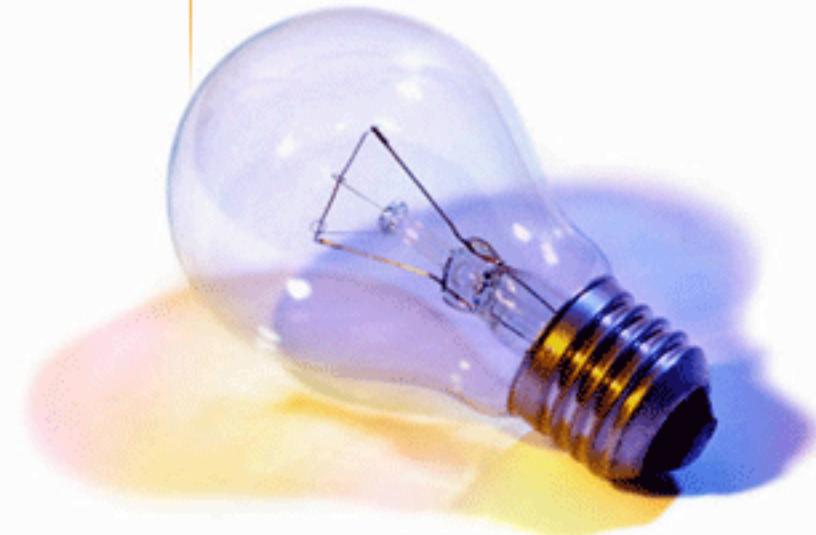
ΤΟ ΛΑΔΙ ΕΧΕΙ ΜΙΚΡΟΤΕΡΗ ΠΥΚΝΟΤΗΤΑ ΑΠΟ ΤΟ ΝΕΡΟ ✓

<https://youtu.be/JzOM1EFPw4>

Moodle question bank

Mathematical

questions





Simple calculated question type

https://docs.moodle.org/en/Simple_calculated_question_type

Solve for x: $\{a\}^*x+\{b\}=\{c\}$

General feedback

Wild card(s) values

Update the wild card(s) values

Set 10 $\{c\}/\{a\}-\{b\}/\{a\}$

$$11.4/1.5-3.4/1.5 = 5.33$$

Η σωστή απάντηση: 5.33 είναι μέσα στα όρια της πραγματικής τιμής.
Min: 5.323333333333 — Max: 5.3433333

Set 9 $\{c\}/\{a\}-\{b\}/\{a\}$

$$10.2/2.5-3.3/2.5 = 2.76$$

Η σωστή απάντηση: 2.76 είναι μέσα στα όρια της πραγματικής τιμής.
Min: 2.75 — Max: 2.77

Set 8 $\{c\}/\{a\}-\{b\}/\{a\}$

$$14.4/8.6-5.1/8.6 = 1.08$$

Η σωστή απάντηση: 1.08 είναι μέσα στα όρια της πραγματικής τιμής.
Min: 1.0713953468372 — Max: 1.0913953468372

The equation root is $x = \frac{\{c\}}{\{a\}} - \frac{\{b\}}{\{a\}}$

Η πίστι της εξίσωσης είναι $x = \frac{\{c\}}{\{a\}} - \frac{\{b\}}{\{a\}}$

\frac{\{c\}}{\{a\}}

wildcard

Answer: 7.59



Ok!!

The equation root is $x = \frac{18.9}{2.2} - \frac{2.2}{2.2}$

The correct answer is: 7.59

https://youtu.be/kLJf0I5XV_Y8



Calculated multichoice question type

https://docs.moodle.org/en/Calculated_multichoice_question_type

Convert from decimal to binary the number {n}

General feedback

Paragraph B I

The correct answer is `\{=decbin({n})\}`

Set 10

Range of Values Minimum 1.0

Decimal places 0

Answers

Choice 1

`\{=decbin({n})\}`

Shared wild card {n}

7

`\{=decbin({n})\}` `\{=decbin(7)\}`
111

`\{=decbin({n}*10)\}` `\{=decbin(7*10)\}`
1000110

`\{=decbin({n}+2)\}` `\{=decbin(7+2)\}`
1001

`\{=decbin({n}+1)\}` `\{=decbin(7+1)\}`
1000

Select one:

- 100 ✓
- 110
- 101000
- 101

Your answer is correct.

The correct answer is 100

<https://youtu.be/n1ChoMQ5U7I>



Calculated question type

https://docs.moodle.org/en/Calculated_question_type

An object has a mass of {m} kg and an acceleration of {a} m/s².

Edit the wildcards datasets

Name
m
a

Answer 1 formula = {m}*{a}

Tolerance ± 0.01 Type Nominal

Unit handling The unit must be given, and will be graded.

Unit penalty 0.4000000 as a fraction (0-1) of the response grade

Unit 1 N Multiplier 1 Answer: 11.31 N ✓

Unit 2 kgm²s⁻² Multiplier 1

Unit 3 kgm²/s² Multiplier 1

ok!!
The force on the object is F=ma=2.9*3.9 N

<https://youtu.be/2C5cmTt8HDY>



Multinumerical question type

Find X and Y such that

$$X + Y < 20$$

$$X * Y > 35$$

Parameters



Constraints

$$X + Y < 20$$

$$X * Y > 35$$

Per constraint feedback



OK : $X + Y < 20$ | No, $X + Y \geq 20$!

OK : $X * Y > 35$ | No, $X * Y$

X : 7

Y : 5

OK : $X + Y < 20$

- Verified constraint : $12.00 < 20.00$

No, $X + Y$

- Unverified constraint : $35.00 > 35.00$

<https://youtu.be/9e3soBnxeyc>



Variable numeric set question type

<http://www.open.edu/openlearncreate/mod/oucontent/view.php?id=52747§ion=2.1.3>

Consider numbers $a = 10$ & $b = 2$.

Calculate the sum of the mean value with the remainder of the division a/b

Predefined variable	Calculated variable
Variable 1 ⓘ Value for variant 1 ⓘ Value for variant 2 ⓘ Value for variant 3 ⓘ Value for variant 4 ⓘ Value for variant 5 ⓘ	Variable 3 ⓘ c=average(a, b) Calculated variable Variable 4 ⓘ d=mod(a,b) Calculated variable Variable 5 ⓘ f=c+d

Answer:
6

Answer:

6



Mean value = 6

Division remainder $(a, b) = 0$

Sum = 6

<https://youtu.be/BnMON4Gif7E>



Variable numeric sets with units

<http://www.open.edu/openlearncreate/mod/oucontent/view.php?id=52747§ion=2.1.4>

A force of $F = 4\text{ N}$ acts on the block at the angle $\theta = 60^\circ$ shown in the diagram. The block moves a horizontal distance of $s=2\text{ m}$. How much work is done by the applied force?

Predefined variable ▾

Variable 1 ⓘ

f

Value for variant 1 ⓘ

1

Unit 1 ⓘ

match(J|Joule|kgm^2s^-2|kgm^2/s^2)

Calculated variable ▾

Variable 3 ⓘ

w=f*s*cos(pi()/3)

Answer:

55 kgm^2/s^2

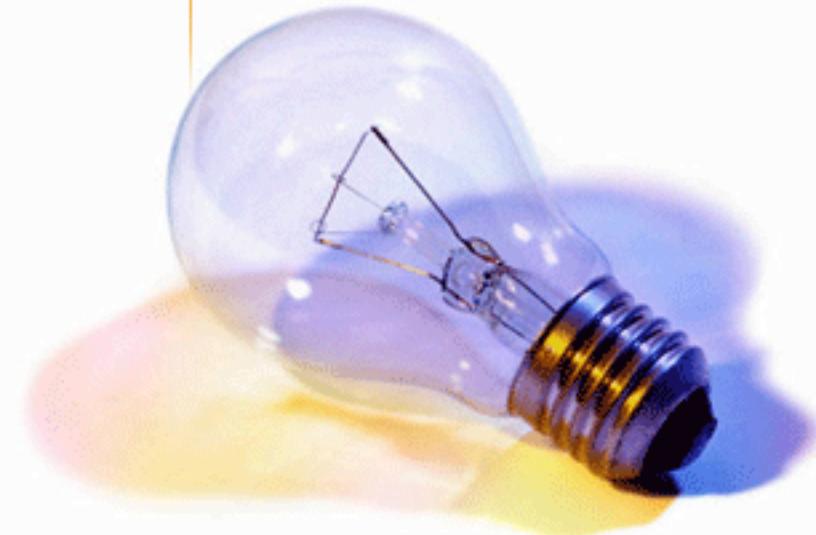


$$W = F \times s \times \cos\theta = 55\text{ J}$$

The correct numerical part of the question is: 55.

<https://youtu.be/gmlrW7oDKyw>

Moodle question bank Geogebra question type





The first idea

<https://dev.geogebra.org/trac/wiki/Moodle/QuestionTypeGeoGebra>



GeoGebra FrageTypplugin für Moodle

Christoph Stadlbauer

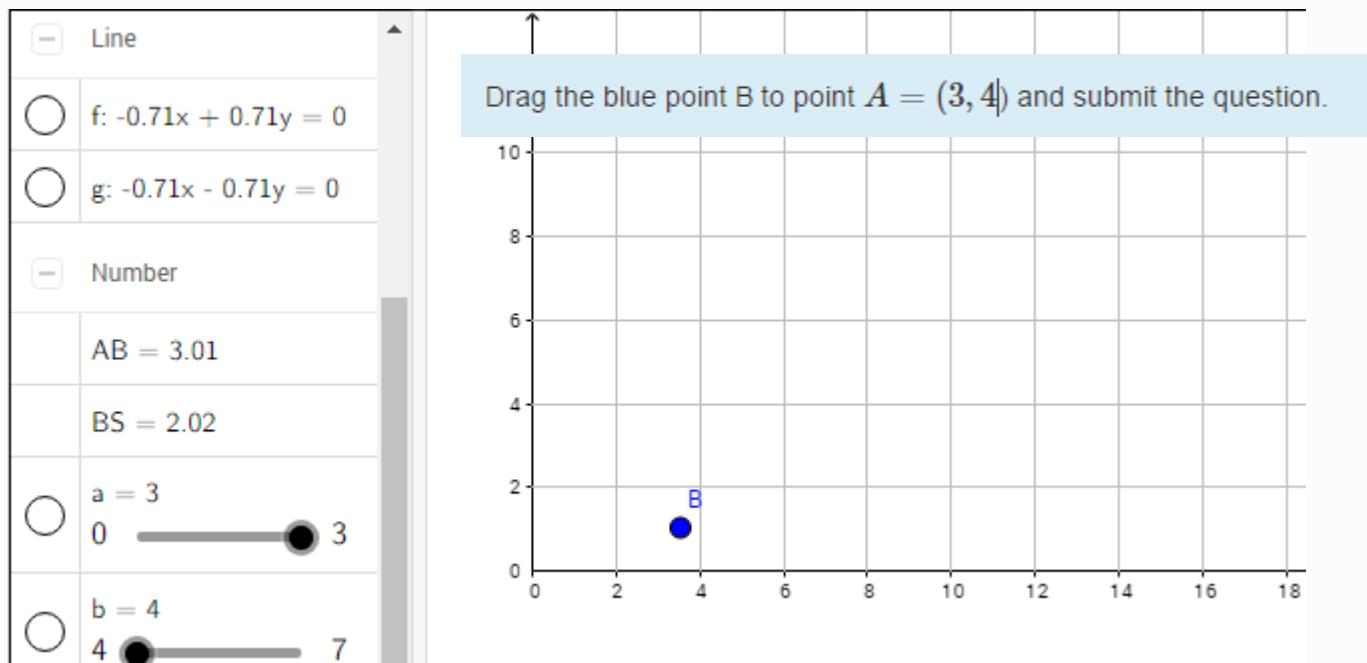
<https://youtu.be/n6IDUytQIMY>



01 Simple question

https://moodle.org/plugins/qtype_geogebra

The Boolean variable is: Distance of points A,B is less than 0.1



<https://youtu.be/RoEmzS10i8>



02 Boolean variables, Geofebra operators, Spreadsheet, Checkboxes

AND		OR	
A	B	A \wedge B	A \vee B
1	1	1	1
0	1	0	1
1	0	0	1
0	0	0	0

NOT			
A	$\neg A$		
1	0		
0	1		

NAND		NOR	
A	B	$\neg(A \wedge B)$	$\neg(A \vee B)$
1	1	0	0
0	1	1	0
1	0	1	0
0	0	1	0

- Boolean Value
 - a = false
 - b = true
 - c = false
 - checkand = true
 - checkboxes = true
 - checknand = false
 - checknor = false
 - checknot = true
 - checkor = false
 - solved = false
 - wrong = true

Variable 1  Variable 1 solved Grade 100% ▾

Feedback  Απάντησες σε όλες τις ερωτήσεις σωστά! All options are correct

Variable 2 Variable 2 wrong Grade None ▾

Feedback Δεν απάντησες σωστά σε κάποια ή κάποιες από τις ερωτήσεις

There is at least one wrong choice

Blanks for 1 more variable(s)

$\neg(A \wedge B) = \neg A \vee \neg B$ box1

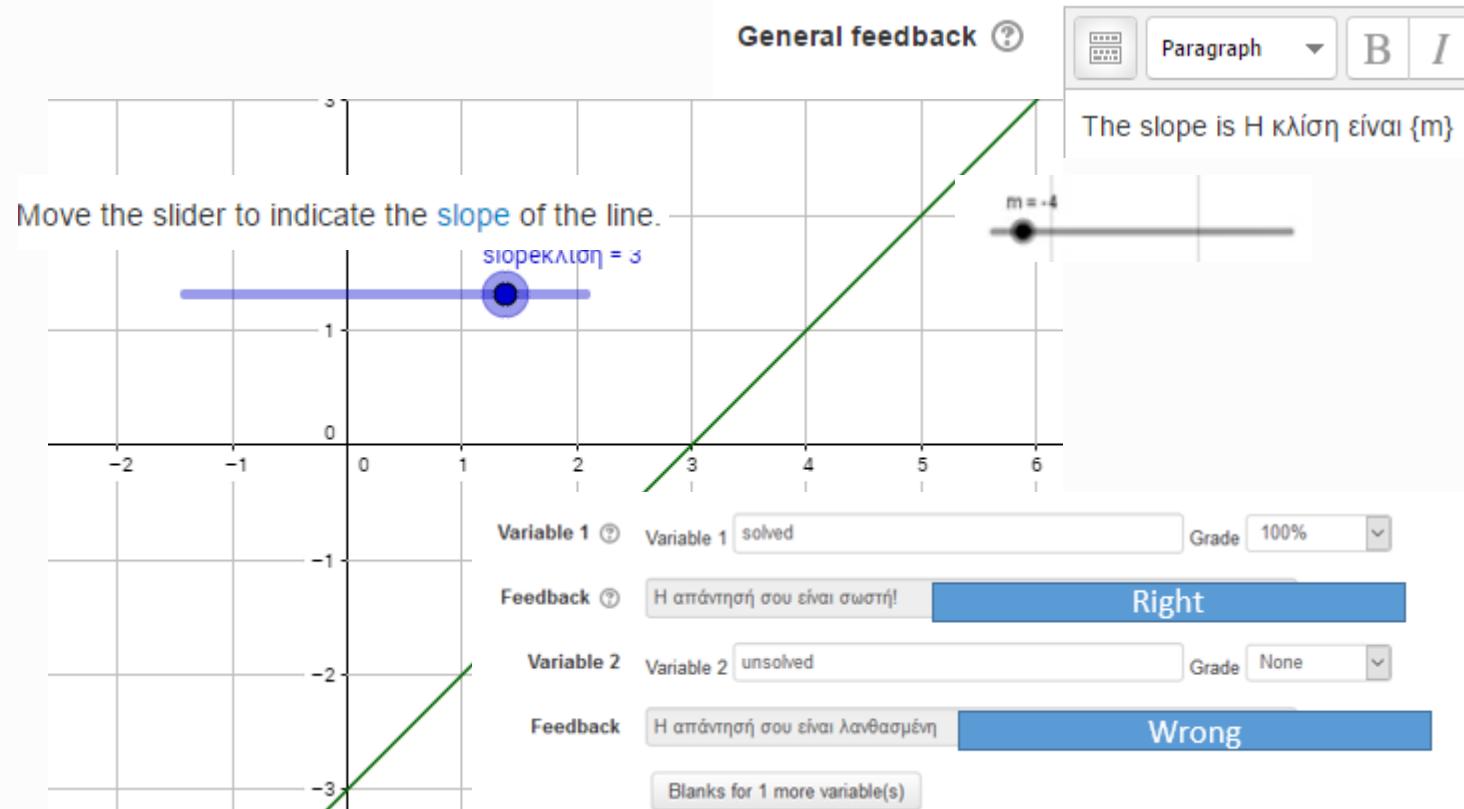
$\neg(A \vee B) = \neg A \wedge \neg B$ box2

AND=NOR box3

<https://youtu.be/UexAOoemOrg>



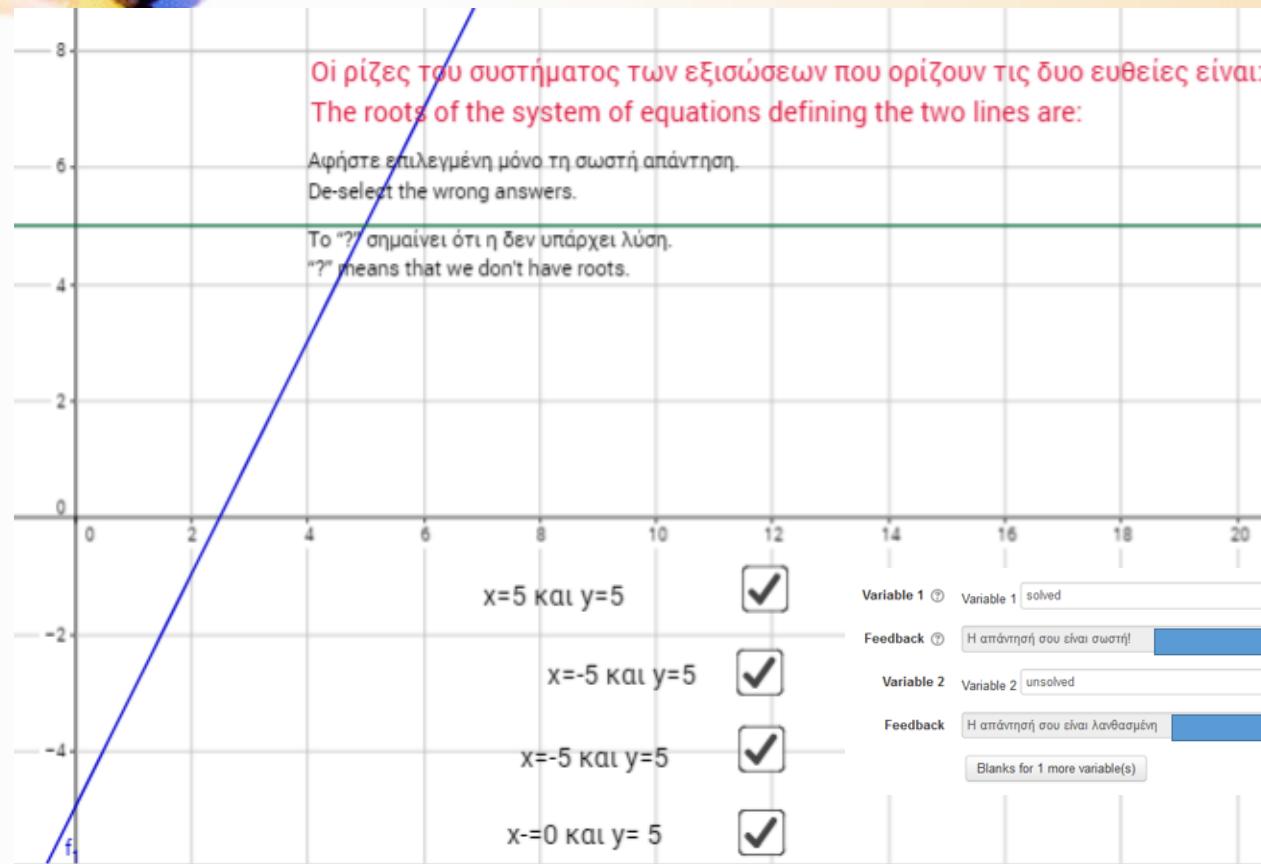
03 Sliders, Placeholders, Random values



<https://youtu.be/QuI-C16X87k>



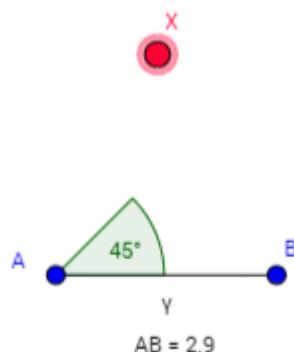
04 Sliders, Checkboxes, Random values in Algebra



<https://youtu.be/qqqOZZyjzx4>



05 Moving point on other Point in Geometry



Construct a triangle $AB\Gamma$ with $AB = 7$, $B\Gamma = 6$
And angle $B\Gamma A$ 45 degrees.

After completing the above, move point X on point Γ .
In this way you will enable Moodle to check your answer!

- Show Icon to Reset Construction
- Enable Shift-Drag & Zoom
- Show Menu
- Show Toolbar
- Show Input Bar

Variable 1 ⓘ Variable 1 solved Grade 100%

Feedback ⓘ Η απάντησή σου είναι σωστή! Right

Variable 2 ⓘ Variable 2 unsolved Grade None

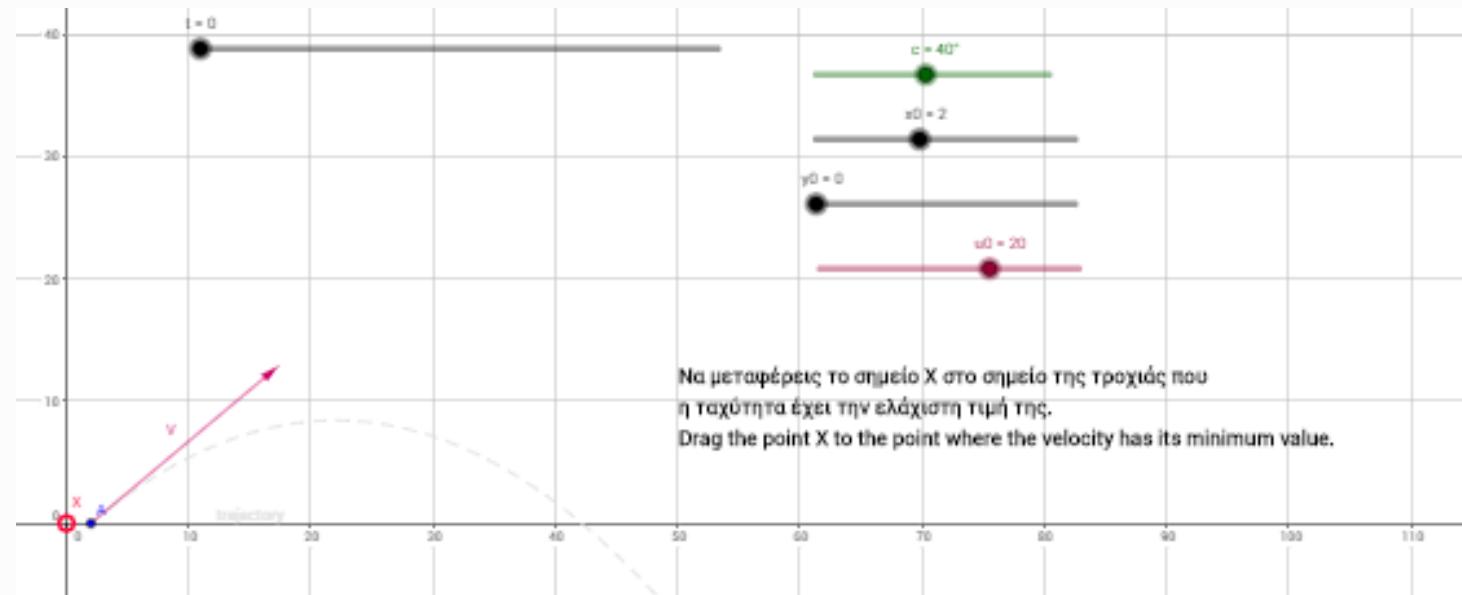
Feedback ⓘ Η απάντησή σου είναι λανθασμένη Wrong

Blanks for 1 more variable(s)

<https://youtu.be/igfMOju2es8>

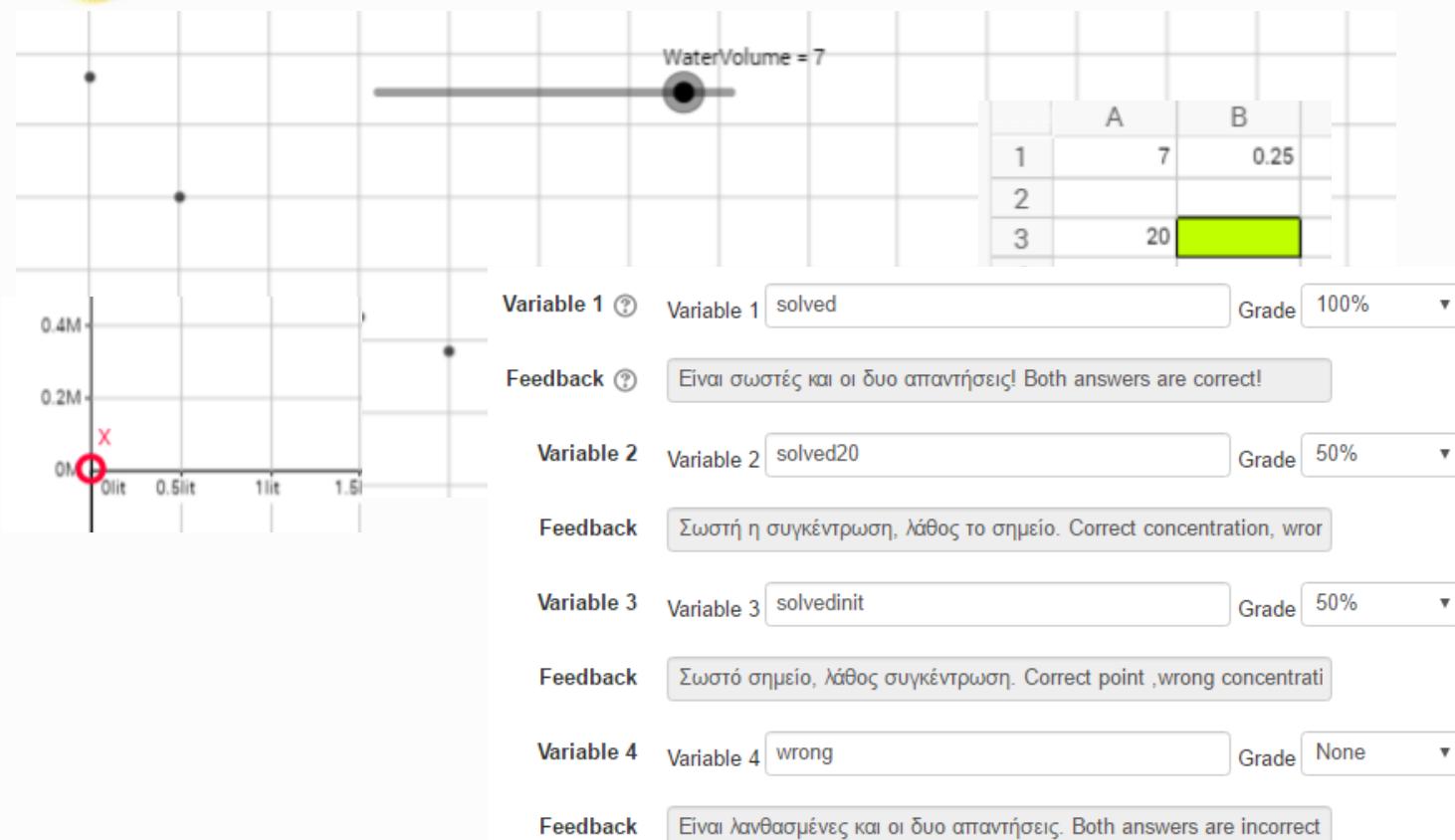


06 Moving point on other Point in Physics



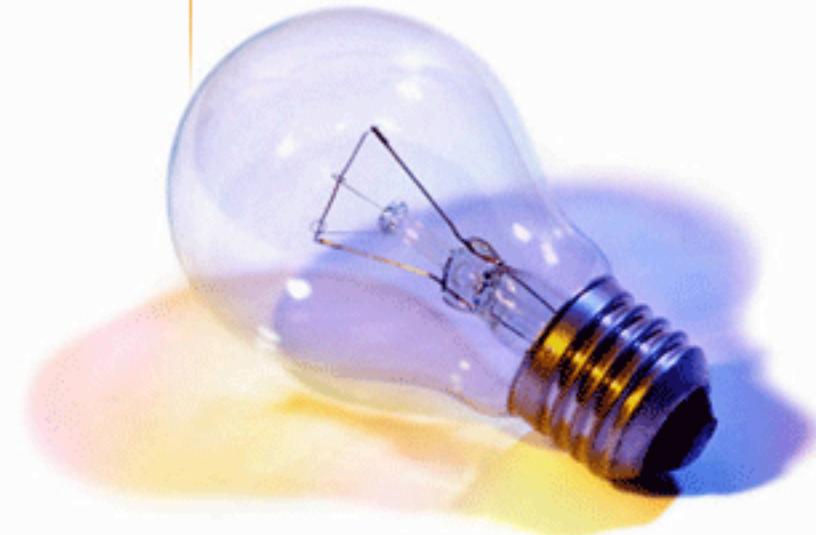
https://youtu.be/je9T_X1b7EE

07 Moving point on other Point in Chemistry, Write in the colored cell



<https://youtu.be/gB1fp9P3A>

Moodle question bank Formulas question type



[The project](#)

[Documentation](#)

[Tutorial](#)



01 Simple question

https://moodle.org/plugins/gtype_formulas

Part 1

Example 1 Simple question

What is $3 + 4$?

7 ✓
One possible correct answer is: 7

Part's mark*

Local variables*

Answer type

Answer*

Grading variables*

Grading criteria*

Unit

Other rules*

Placeholder name

<https://youtu.be/Ksa-jyxt1Ik>



02 Placeholders Numbers Numerics Units

<https://moodle.org/mod/forum/discuss.php?d=163345>

x is the student's answer

a is the correct answer

relative error < 0.01

$$\frac{|x - a|}{a} < 0.01$$

Acceptable x: $0.99a < x < 1.01a$

If

$$a = \frac{5}{6}$$

$$0.825 < x < 0.841667$$

absolute error < 0.01

$$|x - a| < 0.01$$

Acceptable x: $a - 0.01 < x < a + 0.01$

If

$$a = \sqrt{\frac{16}{9}}$$

$$1.3233333 < x < 1.34333$$

Answer the questions:

/hat is $1 + 2$? (#1)

/hat is $(\frac{1}{2} + \frac{1}{3})$? (#2)

/hat is $(\sqrt{16/9})$? (#3)

onvert $(36\frac{km}{h})$ to S.I. (#4)

Answer the questions:

What is $1 + 2$?

3 ✓

One possible correct answer is: 3

What is $\frac{1}{2} + \frac{1}{3}$?

5/6 ✓

One possible correct answer is: 0.833333333333333

What is $\sqrt{\frac{16}{9}}$?

sqrt(16/9) ✓

One possible correct answer is: 1.3333333333333

Convert $36\frac{km}{h}$ to S.I.

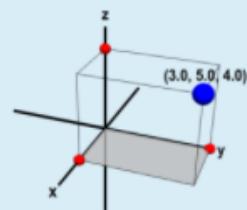
10 m/s ✓

One possible correct answer is: 10 m/s

<https://youtu.be/MysR-xq8i7U>

03 Multiple answer boxes, Units – Names Matrix

Part 3



What are the coordinates of point A? | $x = \underline{0}$, $y = \underline{1}$, $z = \underline{2}$

What are the coordinates of point A? $x = \boxed{3}$, $y = \boxed{5}$, $z = \boxed{4}$



One possible correct answer is: 3, 5, 4

Part 4

What is the identity matrix: I_2

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$\boxed{\left(\begin{array}{cc} \underline{1} & \underline{0} \\ \underline{0} & \underline{1} \end{array} \right)}$$

One possible correct answer is: 1, 0, 0, 1

<https://youtu.be/E1ysceBxf6E>

04 Variables and random values

What is the root of quadratic equation?

$$f(x) = 0$$

$$f(x) = x^2 + 8x + 15$$

$$x_1 = \boxed{} \text{ or } x_2 = \boxed{}$$

Random variables ?

$$x1 = \{-6, -5, -4\};$$

$$x2 = \{-1, -2, -3\};$$

$$s = \{0:4\};$$

Global variables ?

$$b = -(x1 + x2);$$

$$c = x1*x2;$$

$$\text{symbol} = \text{pick}(s, "t", "w", "x", "z");$$

▼ Part 1

Part's mark* ?

1

Local variables* ?

Part's text ?



\(f(\{symbol\}) = {symbol}^2 + {b} {symbol} + {c}) ? (\text{smaller first})

\{symbol\}_1 = {_0} \text{ or } \{symbol\}_2 = {_1}

pe ?

Number

er* ?

[x1,x2]

<https://youtu.be/8BWvzqRofE>



05 Simple algebraic question

Part's mark*

1

Answer type

Algebraic formula

Answer*

"sqrt(x^2 + y^2)"

Grading criteria*

Absolute error

<

1e-10

What is length of the vector (x,y)?

sqrt(x^2 + y^2)



One possible correct answer is: sqrt(x^2 + y^2)

Your answer is correct.

<https://youtu.be/piGBp12ThD8>

06 Algebraic question with variation



Part's mark* ⓘ

2

Local variables* ⓘ

```
x = {1:100};  
base = a*b;  
expo = b-1;
```

Random variables ⓘ

```
a = {3:10};  
b = {3:8}
```

Answer type ⓘ

Algebraic formula ▾

Differentiate: $8x^6$

Answer* ⓘ

"base x^expo"

Differentiate: $5x^4$

Grading variables* ⓘ

Grading criteria* ⓘ

Absolute error ▾

< ▾

1e-10

20 x^3
Algebraic formula
$20 \cdot x^3$

https://youtu.be/kXplugYL9_4

07 Multiple correct answers Grading criteria

Part 1

Multiplying of two factors of -18

$$\boxed{} \cdot \boxed{} = -18$$

Answer* [?](#)

[18,-1]

Grading criteria* [?](#)

_0*_1== -18

Part 2

A number x that is a multiple of 7 and $40 < x < 50$.

$$x = \boxed{}$$

Answer* [?](#)

42

Grading criteria* [?](#)

_0==42 || _0==49

Part 3

A number x that is a multiple of 7 and $6 < x < 16$.

$$x = \boxed{}$$

Answer type [?](#)

Number

Random variables [?](#)

a={6:100:7};

n= {1,2,3};

d= {4,5,6};

Answer* [?](#)

a+8

ing variables* [?](#)

criterion1=_0 % 7==0;
criterion2= a<_0 && _0< a+10;

Grading criteria* [?](#)

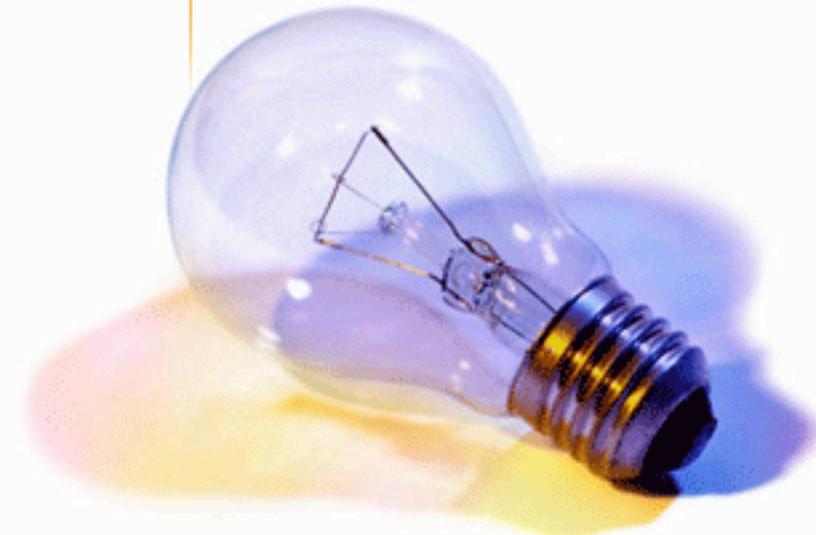
criterion1 && criterion2

<https://youtu.be/LV4ZBksuI8>

Moodle question bank

Wiris

question type



[The tools](#)

[Introduction to WIRIS quizzes](#)

[Moodle demo site](#)



01 Numbers- Biology

<https://docs.moodle.org/all/es/WIRIS>

A cell population doubles every 30 periods. Starting with 1000 cells, how many will be there after 300 periods?

Answer 1

$$1000 \cdot 2^{\frac{300}{30}}$$



Grade

100%



Correct answer

$$\frac{\square}{\square} \quad \sqrt{\square} \quad \sqrt[3]{\square} \quad (\square) \quad \left(\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \right) \quad \div \quad \pi \quad \alpha \quad \leftarrow \quad \leftrightarrow$$

Validation

Variables

$$1000 \cdot 2^{\frac{300}{30}}$$

WIRIS quizzes tour <https://youtu.be/zQiyQ8uyRMQ>



02 Quantities and Units - Geometry

<https://moodle.org/plugins/view.php?plugin=wiris&id=23>

What's the radius of a disc of area 10 cm^2 ?

Correct answer

$\frac{\sqrt{10}}{\pi}$

Validation

$$\sqrt{\frac{10 \text{ cm}^2}{\pi}}$$

Variables

Correct answer

Validation

Variables

Allowed input

- General (formulas, expressions, equations, matrices...)
- Quantity (numbers, measure units, fractions, mixed fractions, ratios...)
- Text (words, sentences, character strings)

Answer:

$\frac{\sqrt{10}}{\pi}$

$$\sqrt{\frac{10}{\pi}} \cdot 10^{-2} \text{ m}$$

Question 1

Correct

Mark 1.00 out of
1.00

WIRIS quizzes tour: <https://youtu.be/WU0eQv1dy2M>



03 Random variables - Geometry

<http://www.wiris.net/demo/wiris/manual/en/html/tour/equaciones.html>

What's the radius of a disc of area 2?

Answer 1

$$\sqrt{\frac{\# a}{\pi}}$$



Grade 100% ▾

What's the radius of a disc of area $\# a$? I

Validation and variables

Comparison: Tolerance digits: 2

Variables: Has algorithm

WIRIS cas

Edit Operations Symbols Analysis Matrix Units Com

a b c d e f g h i j k l m n o p q r s t u v w x y z

a b c d e f g h i j k l m n o p q r u v w x y z

Correct answer

Validation

Variables

Preview

▲ variables ▾

$a = \text{random}(1,10)$



WIRIS quizzes tour <https://youtu.be/WaxGONi5IQ>

04 Simplification Calculations - Arithmetic

Calculate:

$$9 + 2 \cdot 5$$

Calculate: |

$$\#a + \#b \cdot \#c$$

Answer 1

$$\# \sqrt{5}$$

Grade 100% ▾

Validation and variables

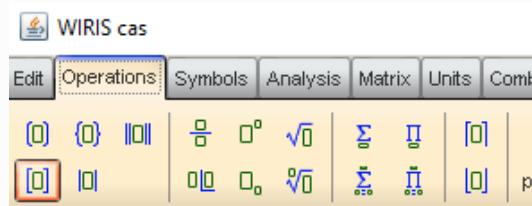
Comparison: Tolerance digits: 2

Properties: is simplified

Variables: Has algorithm

WIRIS cas

Edit Operations Symbols Analysis Matrix Units Comb



Additional properties

Structure:

none ▾

More:

is simplified

Correct answer

Validation

Variables

Preview

Square brackets (vectors)

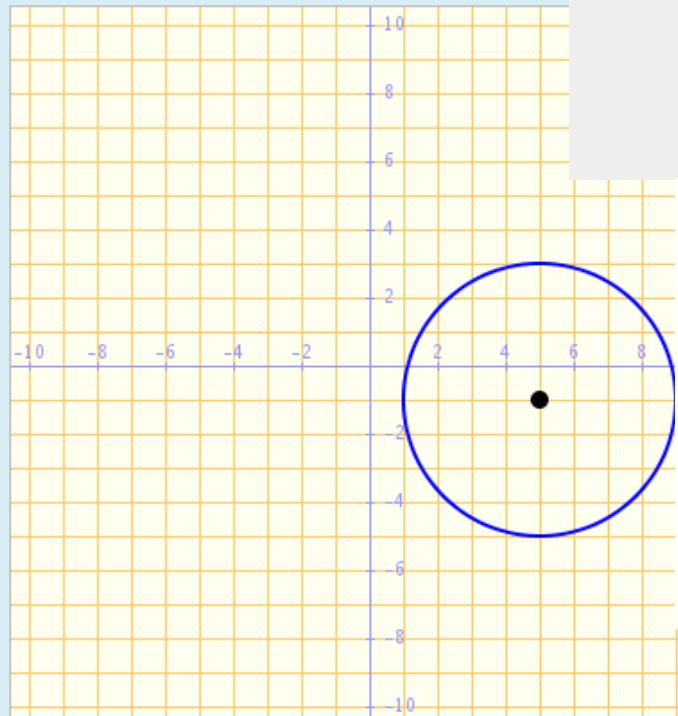
```
a=random(1,10)
b=random(2,5)
c=random(2,5)
r=a+b*c
```



WIRIS quizzes tour: <https://youtu.be/XkHQZnySUM4>

05 Graphs- Plot- Coordinates

What's the radius of this circumference?



Answer 1

#r



Validation and variables

Comparison: Tolerance digits: 2

Variables: Has algorithm

variables

```
r = random(1,5)
c=point(random(-5,5),random(-5,5))
p=plotter(
    window_width=400
    window_height=400
    width=21
    height=21
)
plot(cfr(c,r),{line_width=2,color=blue})
plot(c,{point_size=10})
```

WIRIS quizzes tour: <https://youtu.be/mVW-YZIEIg>



06 Factorization- Algebra

Factorize the polynomial:

$$16 \cdot x^2 + 24 \cdot x - 4 \cdot y^2 + 9$$

Any correct answer is acceptable. The answer should not contain terms that can accept further factorize

Answer:

$$(4 \cdot x - 2 \cdot y + 3) \cdot (4 \cdot x + 2 \cdot y + 3)$$
 ✓ ✓

$$16 \cdot x^2 + 24 \cdot x - 4 \cdot y^2 + 9$$

Polynomial terms that do not contain y are a perfect square trinom

$$(4 \cdot x)^2 + 2 \cdot 4 \cdot 3 + (3)^2 - 4 \cdot y^2$$

$$(4 \cdot x + 3)^2 - 4 \cdot y^2$$

This can also be written as the difference of two squares:

$$(4 \cdot x + 3)^2 - (2 \cdot y)^2$$

We factorize::

$$(4 \cdot x - 2 \cdot y + 3) \cdot (4 \cdot x + 2 \cdot y + 3)$$

$$\text{So } 16 \cdot x^2 + 24 \cdot x - 4 \cdot y^2 + 9 = (4 \cdot x - 2 \cdot y + 3) \cdot (4 \cdot x + 2 \cdot y + 3)$$

The correct answer is: $(4 \cdot x - 2 \cdot y + 3) \cdot (4 \cdot x + 2 \cdot y + 3)$

Properties: is simplified, is factorized

Variables: Has algorithm

```
repeat
    a=random(2..7)
    b=random(2..7)
    c=random(2..7)
    p=(a·x+b)2-(c·y)2
    q=factor(p)
```

```
until a≠b&b≠c
```

```
c1=c2
```

```
e0=string_substitution("(#1·x)2+2·#1·#2+(#2)2-#3·y2",a,b,c1)
```

```
e1=string_substitution("(#1·x+#2)2-#3·y2",a,b,c1)
```

```
e2=string_substitution("(#1·x+#2)2-(#3·y)2",a,b,c)
```

```
p → 49 · x2 + 84 · x - 16 · y2 + 36
```

```
e0 → (7 · x)2 + 2 · 7 · 6 + (6)2 - 16 · y2
```

```
e1 → (7 · x + 6)2 - 16 · y2
```

```
e2 → (7 · x + 6)2 - (4 · y)2
```

```
q → (7 · x - 4 · y + 6) · (7 · x + 4 · y + 6)
```



07 Multiple sub questions -Probabilities

When throwing a fair dice, calculate the probability for each even

K: The outcome is 6

Λ: The outcome is a number greater than 3.

M: The outcome is a number lower than 2.

N: The outcome is an even number.

Write only the number in the gap, using simplified fractions.

w={1,2,3,4,5,6}

repeat

a1=random(1..6)

a2=random(1..6)

a3=random(1..6)

until a1≠a2Λa2≠a3

b=random({1,3,5})

c=random({2,4,6})

$$p1 = \frac{1}{6}$$

$$p2 = \frac{6-b}{6}$$

$$p3 = \frac{c-1}{6}$$

$$p6 = \frac{1}{2}$$

Answer:

$$P(K) = \frac{1}{6} \quad \checkmark \quad \checkmark$$

$$P(\Lambda) = \frac{1}{2} \quad \checkmark \quad \checkmark$$

$$P(M) = \frac{1}{6} \quad \checkmark \quad \checkmark$$

$$P(N) = \frac{1}{2} \quad \checkmark \quad \checkmark$$

$$\begin{aligned} P(K) &= \# p1 \\ P(\Lambda) &= \# p2 \\ P(M) &= \# p3 \\ P(N) &= \# p6 \end{aligned}$$

- Compound answer
 All answers must be correct
 Distribute grade [25 25 25 25]

The experiment sample space: $\Omega = \{1, 2, 3, 4, 5, 6\}$

The probability of the event $K = \{x \in \Omega \mid x = 6\}$ is $P(K) = \frac{1}{6}$

The probability of the event $\Lambda = \{x \in \Omega \mid x > 3\}$ is $P(\Lambda) = \frac{1}{2}$

The probability of the event $M = \{x \in \Omega \mid x < 2\}$ is $P(M) = \frac{1}{6}$

The probability of the event $N = \{x \in \{2, 4, 6\}\}$ is $P(N) = \frac{1}{2}$

https://youtu.be/LdrDElHzQ_g



The Stemcollection and the Greek effort

In [Stemcollection](#) you will find a huge collection of questions, in a variety of languages and free to download.

Vasilis Palilis has contributed to this collection by publishing his own Greek questions. We hope to see soon your own questions in Stemcollection!

<https://stemcollection.com/om/57/el>



They say about us...

We have already run a pilot circle. These are comments from some of the participants:

- The activity helped me to "demystify "and become familiar with the subject.
- Very useful because I did not know how to use these editors to easily add types. I would have probably made them elsewhere and add them as a picture!
- The power of this course is the resources that are given for integrating simulations into lessons and activities.
- I learned question types that I did not know. The content is very useful.
- Difficult when you first start, but then it gives the ability to create differentiated questions, which is too useful!



We start again ...

A new circle starts on **25 January 2019**

See more about this:

<https://stem./widetraining.gr/>



Questions?

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