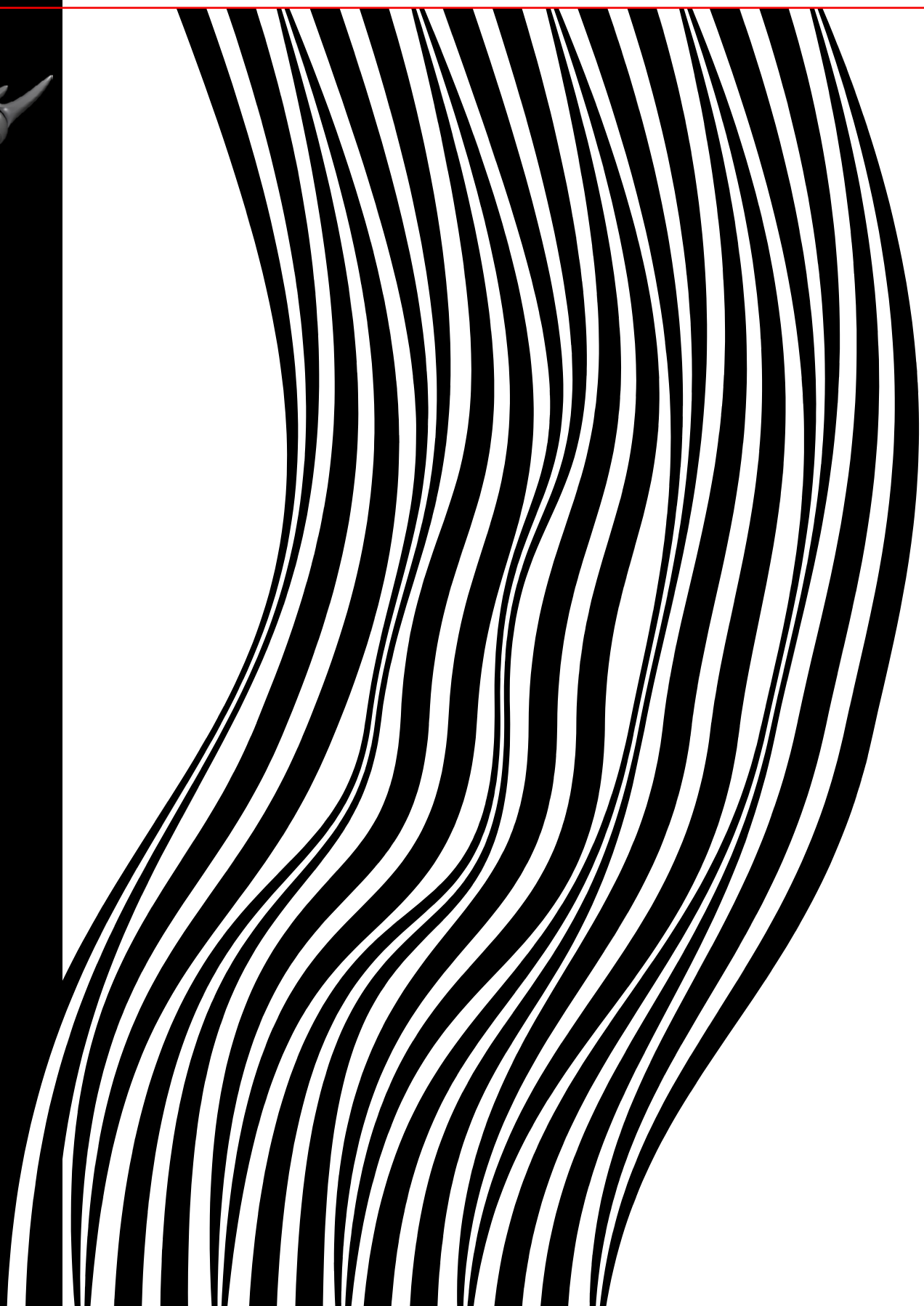**Rhinoceros®**
NURBS modeling for windows

Rhino**script**[101]

for Rhinoceros 4.0

Multiple Choice tests for RhinoScript[101]

Whenever you finish a chapter, you should have learned enough to answer these questions without problems. If it turns out you cannot, you should not press on because the more you move the faster you sink. First try to write a script that resembles the question, then the answer should be evident. If that doesn't work you'll have to reread the respective paragraphs. Some questions are designed to confuse, so don't answer to quickly.

Take your time reading the chapters, run the examples, try to change the examples to gain a deeper understanding of what is happening. Also, these tests are just a cross section of what you could have learned, so if you manage to answer all questions correctly without reading the chapter, that doesn't automatically mean it is safe to skip the whole thing.

If you have any further questions or can't figure out why the answer to question 4 is c and not a, do not hesitate to contact the author:

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1   *What's it all about?*

1	**Macro programmers are the lowest form of life on this planet.**

○   Yes.

○   No.

○   Macro programmers *and* self-replicating viruses.

○   DNA is a macro, so macro programming is the *only* form of life on this planet.

2	**A. Hyphens in Rhino commands are used to supress dialog boxes.** **B. Underscores are used to circumvent localization issues.**

○   Both correct.

○   Both incorrect.

○   The other way around.

○   A is correct, B is incorrect.

3	**Syntax tells us how to write code.**

○   Yes, but there's more to writing code than just syntax.

○   No, syntax only tells us how not to write code.

○   Yes, syntax doesn't tell us how not to write code.

○   I'm confused.

4	**A. Embedding scripts in toolbar buttons is a great way to debug them.** **B. Keeping scripts in separate text files is a great way to distribute them.**

○   Both correct.

○   The other way around.

○   A is correct, B is incorrect.

○   None of the above.

2 *vbScript essentials*

1 Flow control allows us to...

○ Repeat certain instructions.

○ Skip certain instructions.

○ All of the above.

○ None of the above.

2 Flow control requires...

○ Nothing, it exists by itself.

○ Unconditional statements.

○ Conditional statements.

○ Both B and C.

3 Variables are best described as...

○ Conditional values

○ Value placeholders

○ Unknown values

○ Multiple values

4 Why can't we multiply 8.0×10^{300} by 5.0×10^{200} in vbScript?

○ The result is too small to be represented by a double variable.

○ The result is too big to be represented by a double variable.

○ The result cannot be represented by a double variable because it falls into a gap on the double line.

○ The memory of the computer is not large enough to store such huge numbers. After all the result is 4.0×10^{501} and the total number of subatomic particles in the entire universe is only about 1.0×10^{80}

5 dblA = 6.7e-203
**   dblB = -8.3e203**

○ dblA is greater than zero and dblB is smaller than zero.

○ dblA has a bigger magnitude than dblB.

○ A and B are both correct.

○ A and B are both incorrect.

6	**Which of the lines below creates a valid poetic string?**
O	strLine = 'A thing of beauty is a joy forever.'
O	strLine = "I never saw a wild thing sorry for itself.
O	strLine = "O Muse sing in me and through me, " & tell the story..."
O	strLine = "And death " & "shall have " & "no dominion."

7	**Why is it a good idea to use prefixes for variable names?**
O	It keeps you from re-using the same name.
O	It keeps you from assigning invalid values to variables.
O	It makes your code more readable/predictable.
O	It's not just a good idea, it's mandatory.

8	**If we want to use native commands through RhinoScript we have to...**
O	Write the command in the same way as in a macro.
O	Write the command, but encapsulate it in string quotes.
O	Use the Rhino.Command syntax *and* encapsulate the command in string quotes.
O	Only sissies use native commands in scripts.

3 Script anatomy

1   Please recreate the Rhino developer tools diagram below:

2   What's wrong if you get a Microsoft vbScript Compiler error?

O   The script could not be found.

O   You wrote invalid syntax.

O   Nothing is wrong per se, it's just a warning.

O   Your script is going to crash if you continue.

3   The Option Explicit statement forces...

O   The interpreter to declare all variables.

O   The interpreter to ignore all unused variables.

O   Us to declare all variables in advance.

O   Us not to declare any unused variables.

4   A script without a main function call...

O   Crashes when you try to run it.

O   Does nothing when you try to run it.

O   Only executes script level statements.

O   Cannot contain any functions/subroutines.

5   Which of the following statements is correct?

O   You can run scripts with the LoadScript command.

O   You can run scripts with the RunScript command.

O   You can run scripts with the EditScript command.

O   Do I look like an idiot?

4 Operators and functions

1 What are they and why do you care?

2 Which of the following is *not* an operator?

- ⭘ Sin
- ⭘ &
- ⭘ And
- ⭘ Not

3 Which of the following is *not* a programming operator category?

- ⭘ Arithmetic operators
- ⭘ Comparison operators
- ⭘ Bitwise operators
- ⭘ Smooth operators

4 Precedence and mathematics exercise:
A. dblC = dblA + (dblB - dblA) / 2
B. dblC = (dblA + dblB) / 2
C. dblC = (dblA / 2) + (dblB / 2)

- ⭘ B and C are the same.
- ⭘ A and C are the same.
- ⭘ A and B are the same.
- ⭘ You don't fool me, they're all the same.

5 Which is *not* an example of boolean logic in everyday life?

- ⭘ "... will those of you who are playing in the match this afternoon move your clothes down onto the lower peg immediately after lunch, before you write your letter home, if you're not getting your hair cut, unless you've got a younger brother who is going out this weekend as the guest of another boy, in which case, collect his note before lunch, put it in your letter after you've had your hair cut, and make sure he moves your clothes down onto the lower peg for you."
- ⭘ "You must wear a safety helmet while on the construction site."
- ⭘ "You must wear a safety helmet because it's safer."
- ⭘ "You must wear a safety helmet while on the construction site because it's safer."

6   Which is *not* a goal when writing/using functions?

○ Re-use of code

○ Encapsulation

○ Structuring

○ Performance

7   Which of the following statements are correct? (Multiple answers encouraged)

○ Subroutines cannot return a value.

○ Methods can behave like functions, but not like subroutines.

○ Methods is what non-vbScript-native procedures are called.

○ All functions, subs and methods are procedures.

○ You cannot write custom subroutines, only custom functions.

○ Subroutines do not accept ByRef arguments.

8   Square brackets... what do they mean?

○ They indicate mandatory arguments in a procedure signature.

○ They indicate default arguments in a procedure signature.

○ They indicate optional arguments in a procedure signature.

○ They indicate ambiguous arguments in a procedure signature.

9   Why would you use ByRef arguments in a procedure?

○ To avoid casual copying.

○ To enlarge the scope of a procedure.

○ To give a procedure access to variables which would otherwise be out of scope.

○ A and C, but not B.

10   What is the birth cycle of antarctic King Penguins?

○ One chick every year.

○ One chick every two years.

○ Two chicks every three years.

○ One chick in warm years only.

5 *Conditional execution*

1 **If Not (blnA = blnB) Then**
    blnB = blnA
    blnA = Not blnB
End If

- ⭘ If both blnA and blnB are false, they will remain false.
- ⭘ If both blnA and blnB are true, they will remain true.
- ⭘ If only blnA or only blnB is false, they will both become what they are not.
- ⭘ All of the above.
- ⭘ A and B, but not C.

2 **If...Then...ElseIf structures are better than Select...Case structures because...**

- ⭘ They're just better in much the same way in which European football is better than American football.
- ⭘ They're just better in much the same way in which movies with Scarlett Johansson are better than movies with Christina Aguilera.
- ⭘ They allow you to evaluate non-conditional statements as well.
- ⭘ They allow you to use custom conditional statements.

3 **Select...Case structures are better than If...Then...ElseIf structures because...**

- ⭘ You can evaluate multiple conditionals on a single line.
- ⭘ You cannot add additional clauses to an If...Then...ElseIf statement once it's written.
- ⭘ They use a much simpler syntax than If...Then...ElseIf structures, hence they are easier to read.
- ⭘ You always need to add matching else blocks in If...Then statements, even if you don't want to.

4 **What types of loop do we distinguish?**

- ⭘ Incremental and decremental.
- ⭘ Incremental and infinite.
- ⭘ Incremental and conditional.
- ⭘ Incremental and recursive.

5 **Which of the following loops will not execute even a single iteration?**

- ⭘ For i = 0 To 200 Step 10
- ⭘ For i = 0 To -50 Step 10
- ⭘ For i = 0 To 0
- ⭘ For i = 0 To 1 Step 10

6 Arrays

1 **The Subroutine below aims to remove all negative numbers from an array of numbers.**

```
Sub StripNegativeNumbers(ByRef arrNumbers)
    Dim i, j
    j = -1

    For i = 0 To UBound(arrNumbers)
        If arrNumbers(i) >= 0.0 Then
            j = j+1
            arrNumbers(j) = arrNumbers(i)
        End If
    Next

    ReDim Preserve arrNumbers(j)
End Sub
```

A. If arrNumbers is not an array of numeric values, this subroutine will fail.
B. If arrNumbers contains only negative numbers, this subroutine will fail.

O   A is correct.

O   B is correct.

O   Both A and B are correct.

O   Both A and B are incorrect.

2 **When would you use a dynamic array instead of a static one?**

O   When you don't know in advance what kind of variables you need to store.

O   When you don't know in advance how many variables you need to store.

O   When you don't know in advance if you need to change variables later on.

O   When you don't know in advance if you need to copy the array.

3 **Assuming the variables x, y and z contain double variables; which of the following is *not* a valid 3D point declaration?**

O   Dim pt
pt = Array(x, y, z)

O   Dim pt(2)
pt(0) = x
pt(1) = y
pt(2) = z

O   Dim pt()
pt(0) = x
pt(1) = y
pt(2) = z

O   Dim pt
pt = Rhino.PointAdd(Array(0, 0, z), Array(x, y, 0))

4   What do we calculate with a vector crossproduct?

O   The intersection point of two vectors.

O   The angle between two vectors.

O   The normal of the plane in which both vectors lie.

O   Whether or not two vectors are anti-parallel.

5   Imagine you have an array which contains both point and vector definitions. How can you tell them apart?

O   The vectors all start in the world origin.

O   You can compare the lower bounds of the nested arrays.

O   You can compare the upper bounds of the nested arrays.

O   You're up sh*t creek without a paddle, "point" and "vector" are merely human constructs.

1 **A. The boundingbox is part of an objects geometry part**
B. The layer is part of an objects attribute part

- ○ Only A is correct.
- ○ Only B is correct.
- ○ A and B are both correct.
- ○ A and B are both incorrect.
- ○ None of the above.

2 **A. The name is an optional part of the object attribute table**
B. The layer is a mandatory part of the object attribute table
C. An object has to belong to at least one group

- ○ At most one of the above statements is correct.
- ○ At least some of the above statements are incorrect.
- ○ Not all of the above statements are correct or incorrect.
- ○ The incorrect statements outnumber the correct statements.

3 **What is the relation between the $\mathbb{R}^1$ parameter space of a curve object and $\mathbb{R}^3$ world space?**

- ○ Every point in $\mathbb{R}^1$ parameter space has an equivalent point in $\mathbb{R}^3$ world space.
- ○ Every point in $\mathbb{R}^3$ world space has an equivalent point in $\mathbb{R}^1$ parameter space.
- ○ The distance between any $\mathbb{R}^3$ point and its projection onto $\mathbb{R}^1$ space is at most the length of the curve.
- ○ They are just different ways to represent the same coordinate.

4 **Say "R2 parameter space" ten times in a row.**

- ○ No problem.
- ○ I can't.
- ○ That's just stupid.

5 **How do we measure the distance between an $\mathbb{R}^1$ point on a curve and an $\mathbb{R}^2$ point on a surface?**

- ○ Use the Rhino.Distance() method.
- ○ That is impossible.
- ○ Project them onto $\mathbb{R}^3$ world space, then use Rhino.Distance().
- ○ Project the $\mathbb{R}^1$ point onto the surface, then compare the two $\mathbb{R}^2$ points.