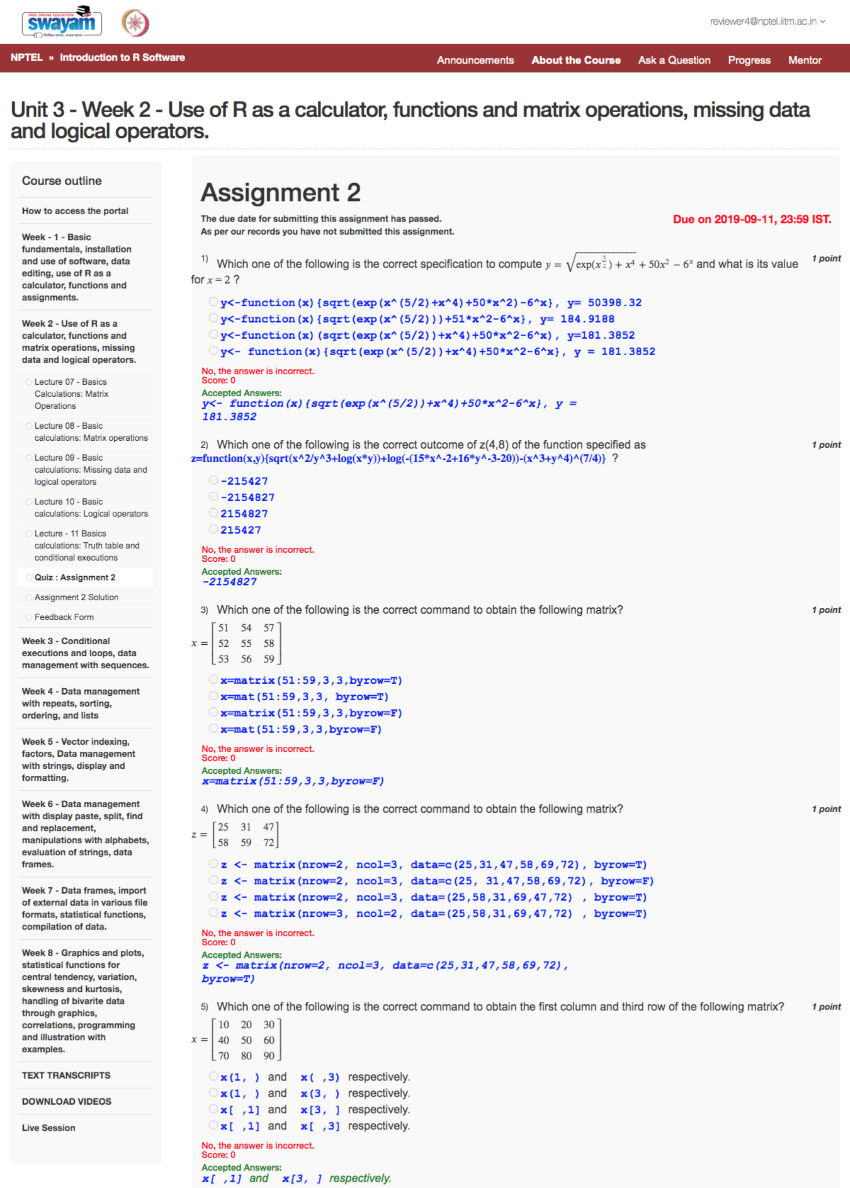

Unit 3 - Week 2 - Use of R as a calculator, functions and matrix operations, missing data and logical operators.

Course outline

How to access the portal

Week - 1 - Basic fundamentals, installation and use of software, data editing, use of R as a calculator, functions and assignments.

Week 2 - Use of R as a calculator, functions and matrix operations, missing data and logical operators.

- ○ Lecture 07 - Basics Calculations: Matrix Operations
- ○ Lecture 08 - Basic calculations: Matrix operations
- ○ Lecture 09 - Basic calculations: Missing data and logical operators
- ○ Lecture 10 - Basic calculations: Logical operators
- ○ Lecture - 11 Basics calculations: Truth table and conditional executions
- ○ Quiz : Assignment 2
- ○ Assignment 2 Solution
- ○ Feedback Form

Week 3 - Conditional executions and loops, data management with sequences.

Week 4 - Data management with repeats, sorting, ordering, and lists

Week 5 - Vector indexing, factors, Data management with strings, display and formatting.

Week 6 - Data management with display paste, split, find and replacement, manipulations with alphabets, evaluation of strings, data frames.

Week 7 - Data frames, import of external data in various file formats, statistical functions, compilation of data.

Week 8 - Graphics and plots, statistical functions for central tendency, variation, skewness and kurtosis, handling of bivariate data through graphics, correlations, programming and illustration with examples.

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Live Session

Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-09-11, 23:59 IST.

1) Which one of the following is the correct specification to compute $y = \sqrt{\exp(x^{\frac{5}{2}}) + x^4} + 50x^2 - 6^x$ and what is its value for $x = 2$? *1 point*

- ○ `y<-function(x){sqrt(exp(x^(5/2)+x^4)+50*x^2)-6^x}, y= 50398.32`
- ○ `y<-function(x){sqrt(exp(x^(5/2)))+51*x^2-6^x}, y= 184.9188`
- ○ `y<-function(x)(sqrt(exp(x^(5/2))+x^4)+50*x^2-6^x), y=181.3852`
- ○ `y<- function(x){sqrt(exp(x^(5/2))+x^4)+50*x^2-6^x}, y = 181.3852`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`y<- function(x){sqrt(exp(x^(5/2))+x^4)+50*x^2-6^x}, y = 181.3852`

2) Which one of the following is the correct outcome of z(4,8) of the function specified as `z=function(x,y){sqrt(x^2/y^3+log(x*y))+log(-(15*x^-2+16*y^-3-20))-(x^3+y^4)^(7/4)}` ? *1 point*

- ○ `-215427`
- ○ `-2154827`
- ○ `2154827`
- ○ `215427`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`-2154827`

3) Which one of the following is the correct command to obtain the following matrix? *1 point*

$$x = \begin{bmatrix} 51 & 54 & 57 \\ 52 & 55 & 58 \\ 53 & 56 & 59 \end{bmatrix}$$

- ○ `x=matrix(51:59,3,3,byrow=T)`
- ○ `x=mat(51:59,3,3, byrow=T)`
- ○ `x=matrix(51:59,3,3,byrow=F)`
- ○ `x=mat(51:59,3,3,byrow=F)`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`x=matrix(51:59,3,3,byrow=F)`

4) Which one of the following is the correct command to obtain the following matrix? *1 point*

$$z = \begin{bmatrix} 25 & 31 & 47 \\ 58 & 59 & 72 \end{bmatrix}$$

- ○ `z <- matrix(nrow=2, ncol=3, data=c(25,31,47,58,69,72), byrow=T)`
- ○ `z <- matrix(nrow=2, ncol=3, data=c(25, 31,47,58,69,72), byrow=F)`
- ○ `z <- matrix(nrow=2, ncol=3, data=(25,58,31,69,47,72) , byrow=T)`
- ○ `z <- matrix(nrow=3, ncol=2, data=(25,58,31,69,47,72) , byrow=T)`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`z <- matrix(nrow=2, ncol=3, data=c(25,31,47,58,69,72), byrow=T)`

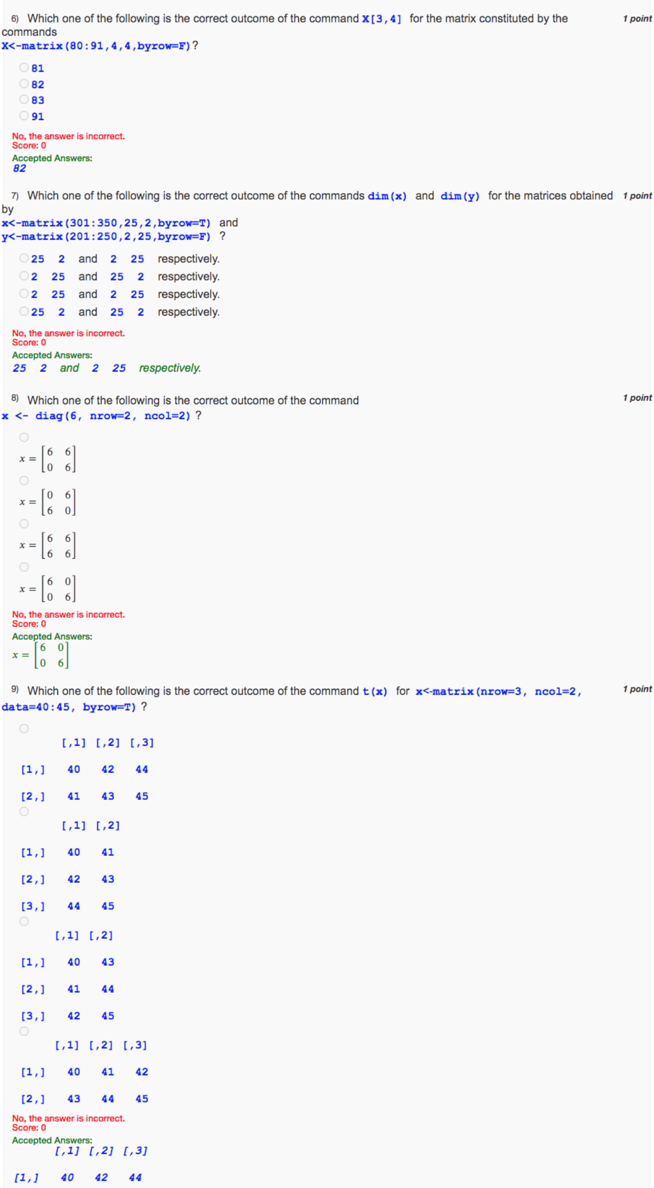
5) Which one of the following is the correct command to obtain the first column and third row of the following matrix? *1 point*

$$x = \begin{bmatrix} 10 & 20 & 30 \\ 40 & 50 & 60 \\ 70 & 80 & 90 \end{bmatrix}$$

- ○ `x(1, )` and `x( ,3)` respectively.
- ○ `x(1, )` and `x(3, )` respectively.
- ○ `x[ ,1]` and `x[3, ]` respectively.
- ○ `x[ ,1]` and `x[ ,3]` respectively.

No, the answer is incorrect.
Score: 0

Accepted Answers:
`x[ ,1]` and `x[3, ]` respectively.



6) Which one of the following is the correct outcome of the command `X[3,4]` for the matrix constituted by the commands `X<-matrix(80:91,4,4,byrow=F)`? *1 point*

○ 81
○ 82
○ 83
○ 91

No, the answer is incorrect.
Score: 0

Accepted Answers:
82

7) Which one of the following is the correct outcome of the commands `dim(x)` and `dim(y)` for the matrices obtained by *1 point*
`x<-matrix(301:350,25,2,byrow=T)` and
`y<-matrix(201:250,2,25,byrow=F)` ?

○ 25 2 and 2 25 respectively.
○ 2 25 and 25 2 respectively.
○ 2 25 and 2 25 respectively.
○ 25 2 and 25 2 respectively.

No, the answer is incorrect.
Score: 0

Accepted Answers:
25 2 and 2 25 respectively.

8) Which one of the following is the correct outcome of the command *1 point*
`x <- diag(6, nrow=2, ncol=2)` ?

○ $x = \begin{bmatrix} 6 & 6 \\ 0 & 6 \end{bmatrix}$

○ $x = \begin{bmatrix} 0 & 6 \\ 6 & 0 \end{bmatrix}$

○ $x = \begin{bmatrix} 6 & 6 \\ 6 & 6 \end{bmatrix}$

○ $x = \begin{bmatrix} 6 & 0 \\ 0 & 6 \end{bmatrix}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$x = \begin{bmatrix} 6 & 0 \\ 0 & 6 \end{bmatrix}$

9) Which one of the following is the correct outcome of the command `t(x)` for `x<-matrix(nrow=3, ncol=2, data=40:45, byrow=T)` ? *1 point*

○
```
       [,1] [,2] [,3]

[1,]    40   42   44

[2,]    41   43   45
```
○
```
       [,1] [,2]

[1,]    40   41

[2,]    42   43

[3,]    44   45
```
○
```
      [,1] [,2]

[1,]    40   43

[2,]    41   44

[3,]    42   45
```
○
```
      [,1] [,2] [,3]

[1,]    40   41   42

[2,]    43   44   45
```

No, the answer is incorrect.
Score: 0

Accepted Answers:
```
      [,1] [,2] [,3]

[1,]    40   42   44
```

```
[2,]   41   43   45
```

10) Which one of the following is the correct command to obtain the multiplication of three matrices **`x`**, **`y`** and **`z`** of the same order? *1 point*

○ `x**y**z`
○ `x*%*y*%*z`
○ `x%*%y%*%z`
○ `x%**%y%**%z`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`x%*%y%*%z`

11) Which one of the following is the correct command to obtain the multiplication of two matrices $x = \begin{bmatrix}55 & 77\\66 & 88\end{bmatrix}$ and $y = \begin{bmatrix}22 & 23\\26 & 21\end{bmatrix}$ along with its correct answer? *1 point*

○

`x*y`   and its correct answer is

```
      [,1] [,2]

[1,] 1210 1771

[2,] 1716 1848
```

○

`x*%*y` and its correct answer is

```
      [,1] [,2]

[1,] 3212 2882

[2,] 3740 3366
```

○

`x%*%y`   and its correct answer is

```
      [,1] [,2]

[1,] 3212 2882

[2,] 3740 3366
```

○

`x%%*%%y`   and its correct answer is

```
      [,1] [,2]

[1,] 3212 2882

[2,] 3740 3366
```

No, the answer is incorrect.
Score: 0

Accepted Answers:
`x%*%y`   *and its correct answer is*

```
      [,1] [,2]

[1,] 3212 2882

[2,] 3740 3366
```

12) Let `x<- matrix(nrow=3, ncol=3, data=69:61, byrow=F)` then which one of the following is the correct outcome of `7*x` ? *1 point*

○

```
      [,1] [,2] [,3]

[1,]   483   462   441

[2,]   476   455   434

[3,]   469   448   427
```

○

```
      [,1] [,2] [,3]

[1,]   483   476   469

[2,]   462   455   448

[3,]   441   434   427
```

○

```
      [,1] [,2] [,3]

[1,]   483   476   469
```

```
[2,]  441  434  427

[3,]  462  455  448
```

○

```
      [,1] [,2] [,3]

[1,]  441  434  427

[2,]  483  476  469

[3,]  462  455  448
```

No, the answer is incorrect.
Score: 0

Accepted Answers:

```
      [,1] [,2] [,3]

[1,]  483  462  441

[2,]  476  455  434

[3,]  469  448  427
```

13) Which one of the following is the correct command to obtain the addition of two matrices $x = \begin{bmatrix} 55 & 77 \\ 66 & 88 \end{bmatrix}$ and $y = \begin{bmatrix} 22 & 23 \\ 26 & 21 \end{bmatrix}$ along with its correct answer? *1 point*

○ `x + y`

and its correct answer is

```
      [,1] [,2]
[1,]    77  100
[2,]    92  109
```

○

`x %+% y`

and its correct answer is

```
      [,1] [,2]
[1,]    77  92
[2,]    100 109
```

○

`x %%+%% y`

and its correct answer is

```
      [,1] [,2]
[1,]    77  100
[2,]    92  109
```

○

`x %+%+ y`

and its correct answer is

```
      [,1] [,2]
[1,]    92  109
[2,]    77  100
```

No, the answer is incorrect.
Score: 0

Accepted Answers:

`x + y`

and its correct answer is

```
      [,1] [,2]
[1,]    77  100
[2,]    92  109
```

14) Let `x<- matrix(nrow=4, ncol=4, data=26:41, byrow=F)` then which one of the following is the correct outcome of `4%*%x + x%*%x`? *1 point*

○

```
      [,1] [,2] [,3] [,4]

[1,] 3644 3758 3872 3986

[2,] 4172 4302 4432 4562

[3,] 4700 4846 4992 5138

[4,] 5228 5390 5552 5714
```

○

```
      [,1] [,2] [,3] [,4]

[1,] 3644 4172 4700 5228

[2,] 3758 4302 4846 5390
```

```
[3,] 3872 4432 4992 5552

[4,] 3986 4562 5138 5714
```

○ `Error...`

○ None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
`Error...`

15) Which one of the following is the correct outcome of `X[ ,3]` for the matrix specified by `X<-matrix(nrow=3, ncol=3, data=c(15,20,25,30,35,40,45,50,55), byrow=T)` ? **1 point**

○ `[1] 25 40 55`

○ `[1] 45 50 55`

○ `[1] 55 40 25`

○ `[1] 55 50 45`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`[1] 25 40 55`

16) Which one of the following is the correct outcome of `x[2:3,3:4]` for the matrix specified by `x<-matrix(nrow=4, ncol=4, data=26:41, byrow=F)`? **1 point**

○

```
     [,1] [,2]

[1,]   35   36

[2,]   39   40
```

○

```
     [,1] [,2]

[1,]   35   39

[2,]   36   40
```

○

```
     [,1] [,2]

[1,]   39   40

[2,]   35   36
```

○

```
     [,1] [,2]

[1,]   39   35

[2,]   40   36
```

No, the answer is incorrect.
Score: 0

Accepted Answers:

```
     [,1] [,2]

[1,]   35   39

[2,]   36   40
```

17) Which one of the following is the correct command to get the matrix $\begin{bmatrix} 28 & 38 \\ 58 & 68 \\ 88 & 98 \end{bmatrix}$ from the matrix specified by **1 point**

`X<-matrix(nrow=4, ncol=3, data=c(18,28,38,48,58,68,78,88,98, 108,110,112), byrow=T)` ?

○ `X[2:3, 1:3]`

○ `X[1:3, 2:3]`

○ `X[1:1, 2:2, 3:3]`

○ `X[3:3, 2:2, 1:1]`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`X[1:3, 2:3]`

18) Which of the following is the correct command to create the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$ in R? **1 point**

○ `matrix(nrow=2, ncol=3, data=c(1,2,3,4,5,6), byrow=T)`

○ `matrix(nrow=3, ncol=2, data=c(1,2,3,4,5,6), byrow=T)`

○ `matrix(nrow=2, ncol=3, data=c(1,2,3,4,5,6), byrow=F)`

○ `matrix(nrow=3, ncol=2, data=c(1,2,3,4,5,6), byrow=F)`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`matrix(nrow=2, ncol=3, data=c(1,2,3,4,5,6), byrow=T)`

19) Suppose `x` is any vector as `x=c(10, 80, 90, 101:200, NA)` then which one of the following is the correct outcome of the command `var(x)`? *1 point*

○

`1088.04`

○

`4632.2`

○

`Error...`

○

`NA`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`NA`

20) Which one of the following is the correct outcome of the command `(x > 12) || (x < 14) & (x < 14) && (x > 11)||(x == 12)` when `x = 12` and when `x = -12` ? *1 point*

○ `FALSE` and `FALSE` respectively.
○ `TRUE` and `FALSE` respectively.
○ `FALSE` and `TRUE` respectively.
○ `TRUE` and `TRUE` respectively.

No, the answer is incorrect.
Score: 0

Accepted Answers:
`TRUE` and `FALSE` respectively.

21) Suppose `x = 10:16` then which one of the following is the correct outcome of the command `(x > 12) | (x < 15)` ? *1 point*

○ `TRUE TRUE TRUE TRUE TRUE TRUE TRUE`
○ `FALSE FALSE FALSE FALSE FALSE FALSE FALSE`
○ `TRUE TRUE FALSE FALSE FALSE FALSE TRUE`
○ `FALSE FALSE TRUE TRUE TRUE TRUE FALSE`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`TRUE TRUE TRUE TRUE TRUE TRUE TRUE`

22) Suppose `x = 4:16` then which one of the following correctly specifies the outcome of the following statement: `x[(x > 3) & (x < 17)]` and `x[(x > 4) || (x < 17)]` ? *1 point*

○ are different for both as `4 5 6 7 8 9` and `10 11 12 13 14 15 16` respectively.
○ are the same for both as `4 5 6 7 8 9 10 11 12 13 14 15 16`
○ are different for both as `10 11 12 13 14 15 16` and as `4 5 6 7 8 9` respectively.
○ are the same for both as as `4 5 6 7 8 9`

No, the answer is incorrect.
Score: 0

Accepted Answers:
are the same for both as `4 5 6 7 8 9 10 11 12 13 14 15 16`

23) Suppose `x = 100:500` then which one of the following is the correct command to know that which of the values in `x` are more than 300 and less than 400? *0 points*

○ `x[(x > 300) & (x < 400)]`
○ `x[(x > 300) & (x < 400)]`
○ `x[(x >= 400) & (x >= 400)]`
○ `x[(x <= 400) & (x <= 400)]`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`x[(x > 300) & (x < 400)]`

24) Suppose `x = 15:20`, then which of the following is the correct outcome of the command `x[(x > 15) | (x < 19)]`? *1 point*

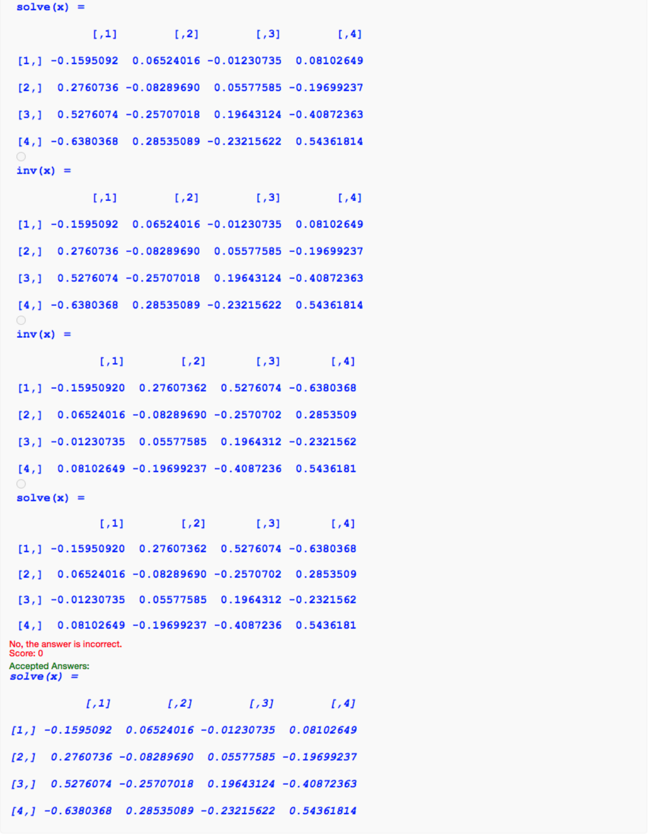
○ `15 16 17 18 19 20`
○ `16 17 18`
○ `15 19 20`
○ `FALSE TRUE TRUE TRUE FALSE FALSE`

No, the answer is incorrect.
Score: 0

Accepted Answers:
`15 16 17 18 19 20`

25) If $x = \begin{bmatrix} 11 & 21 & 16 & 18 \\ 34 & 36 & 12 & 17 \\ 42 & 24 & 34 & 28 \\ 13 & 16 & 27 & 26 \end{bmatrix}$ then which one of the following is the correct command and its outcome for obtaining the inverse of the matrix `x` ? *1 point*

○



```
solve(x) =

            [,1]        [,2]        [,3]        [,4]

[1,] -0.1595092  0.06524016 -0.01230735  0.08102649

[2,]  0.2760736 -0.08289690  0.05577585 -0.19699237

[3,]  0.5276074 -0.25707018  0.19643124 -0.40872363

[4,] -0.6380368  0.28535089 -0.23215622  0.54361814
```

○

```
inv(x) =

            [,1]        [,2]        [,3]        [,4]

[1,] -0.1595092  0.06524016 -0.01230735  0.08102649

[2,]  0.2760736 -0.08289690  0.05577585 -0.19699237

[3,]  0.5276074 -0.25707018  0.19643124 -0.40872363

[4,] -0.6380368  0.28535089 -0.23215622  0.54361814
```

○

```
inv(x) =

             [,1]        [,2]       [,3]       [,4]

[1,] -0.15950920  0.27607362  0.5276074 -0.6380368

[2,]  0.06524016 -0.08289690 -0.2570702  0.2853509

[3,] -0.01230735  0.05577585  0.1964312 -0.2321562

[4,]  0.08102649 -0.19699237 -0.4087236  0.5436181
```

○

```
solve(x) =

             [,1]        [,2]       [,3]       [,4]

[1,] -0.15950920  0.27607362  0.5276074 -0.6380368

[2,]  0.06524016 -0.08289690 -0.2570702  0.2853509

[3,] -0.01230735  0.05577585  0.1964312 -0.2321562

[4,]  0.08102649 -0.19699237 -0.4087236  0.5436181
```

No, the answer is incorrect.
Score: 0

Accepted Answers:

```
solve(x) =

            [,1]        [,2]        [,3]        [,4]

[1,] -0.1595092  0.06524016 -0.01230735  0.08102649

[2,]  0.2760736 -0.08289690  0.05577585 -0.19699237

[3,]  0.5276074 -0.25707018  0.19643124 -0.40872363

[4,] -0.6380368  0.28535089 -0.23215622  0.54361814
```