Question 1

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# Part A

A = matrix(c(3, 4, 2, 2), nrow = 2, ncol = 2, byrow = TRUE)  
B = matrix(c(1, 3, 2, 4), nrow = 2, ncol = 2, byrow = TRUE)  
  
dim(A)

## [1] 2 2

dim(B)

## [1] 2 2

A is 2 x 2, and B is 2 x 2

# Part B

Element is 4

# Part C

A + B

## [,1] [,2]  
## [1,] 4 7  
## [2,] 4 6

# Part D

A - B

## [,1] [,2]  
## [1,] 2 1  
## [2,] 0 -2

# Part E

A %\*% B

## [,1] [,2]  
## [1,] 11 25  
## [2,] 6 14

# Part F

B %\*% A

## [,1] [,2]  
## [1,] 9 10  
## [2,] 14 16

# Part G

No, . This is to be expected, because they are not symmetrical matrices.

# Part H

t(A)

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

A is not a symmetric matrix. It is only symmetric if

# Part I

t(A %\*% B)

## [,1] [,2]  
## [1,] 11 6  
## [2,] 25 14

t(B) %\*% t(A)

## [,1] [,2]  
## [1,] 11 6  
## [2,] 25 14

Therefore,

# Part J

AI = solve(A)

AI

## [,1] [,2]  
## [1,] -1 2.0  
## [2,] 1 -1.5

# Part K

I = matrix(c(1, 0, 0, 1), nrow = 2, ncol = 2, byrow = TRUE)  
I

## [,1] [,2]  
## [1,] 1 0  
## [2,] 0 1

A %\*% AI

## [,1] [,2]  
## [1,] 1 0  
## [2,] 0 1