# Matrix-HW.R

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2020-01-10

```
# Question 1
oneA <- matrix(c(1, 5, 3, 2), nrow = 2)
oneB <- matrix(c(4, 2, 9, 6), nrow = 2)
oneA + oneB
```

```
##      [,1] [,2]
## [1,]    5   12
## [2,]    7    8
```

```
oneA - oneB
```

```
##      [,1] [,2]
## [1,]   -3   -6
## [2,]    3   -4
```

```
oneA %*% oneB
```

```
##      [,1] [,2]
## [1,]   10   27
## [2,]   24   57
```

```
oneB %*% oneA
```

```
##      [,1] [,2]
## [1,]   49   30
## [2,]   32   18
```

```
# Question 2
twoA <- matrix(c(9, 1, 1, 4), nrow = 2)
twoB <- matrix(c(2, 3, 6, 1, 5, 8), nrow = 2)
#twoA + twoB
#twoA - twoB
twoA %*% twoB
```

```
##      [,1] [,2] [,3]
## [1,]   21   55   53
## [2,]   14   10   37
```

```r
#twoB %*% twoA

# Question 3
threeA <- matrix(c(4, 11, 3, 2), nrow = 2)
threeB <- matrix(c(2, 8, 8, 12), nrow = 2)
threeC <- matrix(c(1, 1, 2, 1, 3, 5, 2, 5, 8), nrow = 3)
threeD <- matrix(c(4, 2, 4, 4), nrow = 2)
t(threeA)
```

```
##      [,1] [,2]
## [1,]    4   11
## [2,]    3    2
```

```r
t(threeB)
```

```
##      [,1] [,2]
## [1,]    2    8
## [2,]    8   12
```

```r
t(threeC)
```

```
##      [,1] [,2] [,3]
## [1,]    1    1    2
## [2,]    1    3    5
## [3,]    2    5    8
```

```r
t(threeD)
```

```
##      [,1] [,2]
## [1,]    4    2
## [2,]    4    4
```

```r
# Question 4
solve(threeA)
```

```
##       [,1]  [,2]
## [1,] -0.08  0.12
## [2,]  0.44 -0.16
```

```r
solve(threeB)
```

```
##      [,1]  [,2]
## [1,] -0.3  0.20
## [2,]  0.2 -0.05
```

```r
solve(threeA %*% threeB)
```

```
##        [,1]   [,2]
## [1,]  0.112 -0.068
## [2,] -0.038  0.032
```

```r
solve(threeB) %*% solve(threeA)
```

```
##        [,1]   [,2]
## [1,]  0.112 -0.068
## [2,] -0.038  0.032
```

```r
# Question 6
sixA <- matrix(c(4, 11, 3, 2), nrow = 2)
sixB <- matrix(c(2, 5, 1, 6, 8, 333, 1, 10, 4, 1, 7, 423, 0, 0, 0, 0), nrow = 4)
sixC <- matrix(c(1, 1, 2, 1, 3, 5, 2, 5, 8), nrow = 3)
sixD <- matrix(c(4, 0, 0, 2), nrow = 2)
det(sixA)
```

```
## [1] -25
```

```r
det(sixB)
```

```
## [1] 0
```

```r
det(sixC)
```

```
## [1] -1
```

```r
det(t(sixC))
```

```
## [1] -1
```

```r
det(sixD)
```

```
## [1] 8
```

```r
det(solve(sixD))
```

```
## [1] 0.125
```

```r
# Question 7
sevenA <- matrix(c(7, -3, 9, 3, 2, 4, 3, 1, 5, 0, 6, 2, 8, 2, 5, 1), nrow = 4)
sevenA11 <- sevenA[1:2, 1:3]
sevenA12 <- matrix(sevenA[1:2, 4], nrow = 2)
sevenA21 <- sevenA[3:4, 1:3]
sevenA22 <- matrix(sevenA[3:4, 4], nrow = 2)
```