2장 MATLAB 기초

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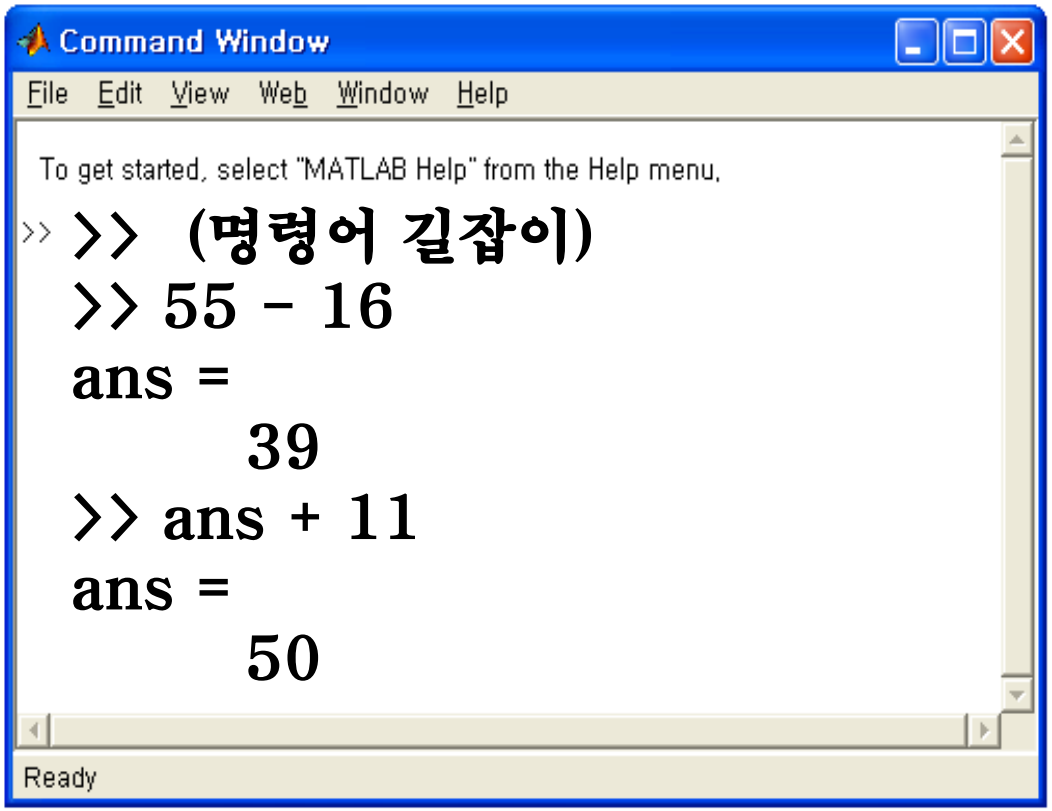
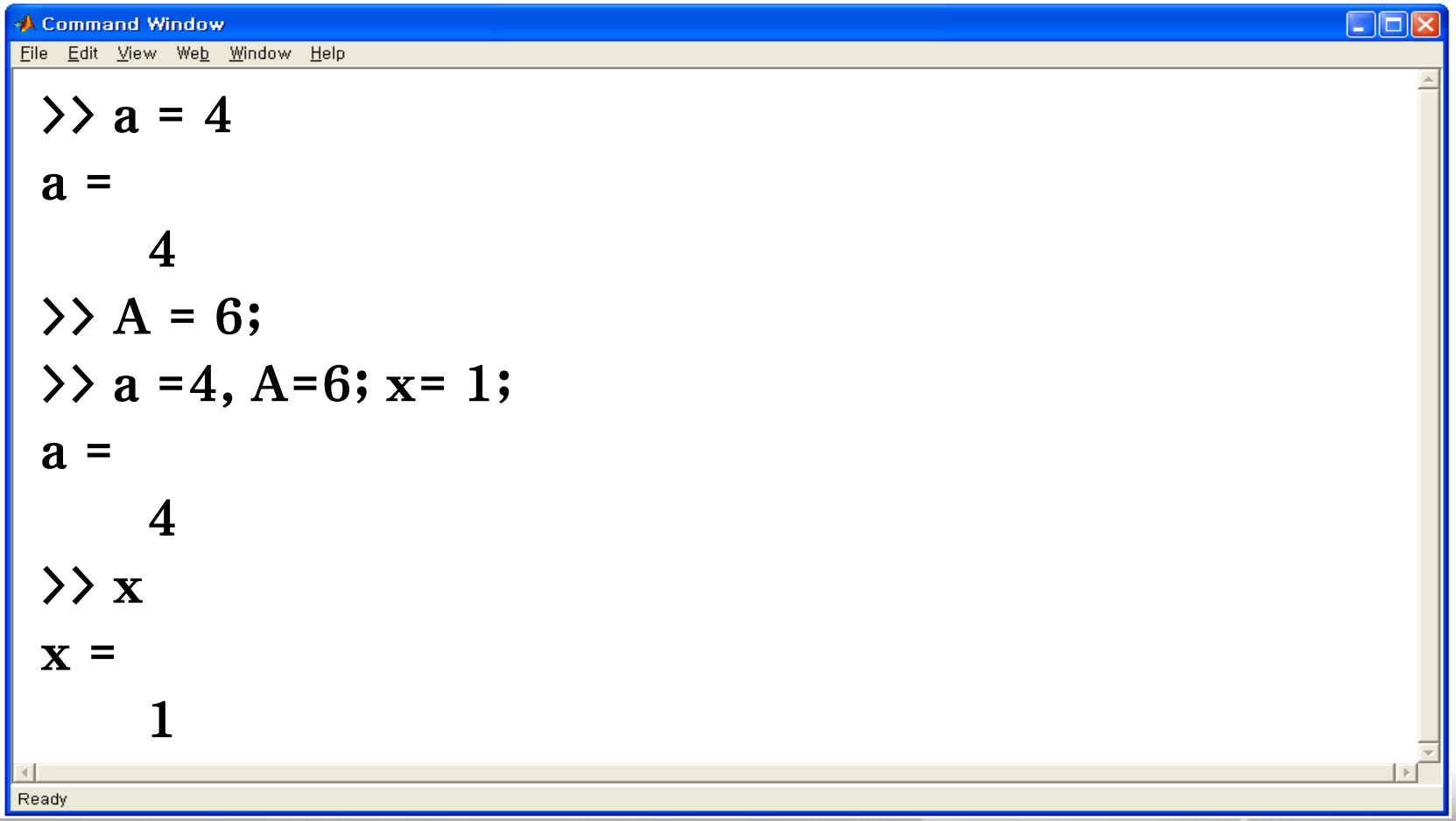
2.1 MATLAB 환경



- **명령창**
  - 명령을 입력하는 창
- **그래프창**
  - 그래프를 나타내는 창
- **편집창**
  - M-파일을 편집하는 창

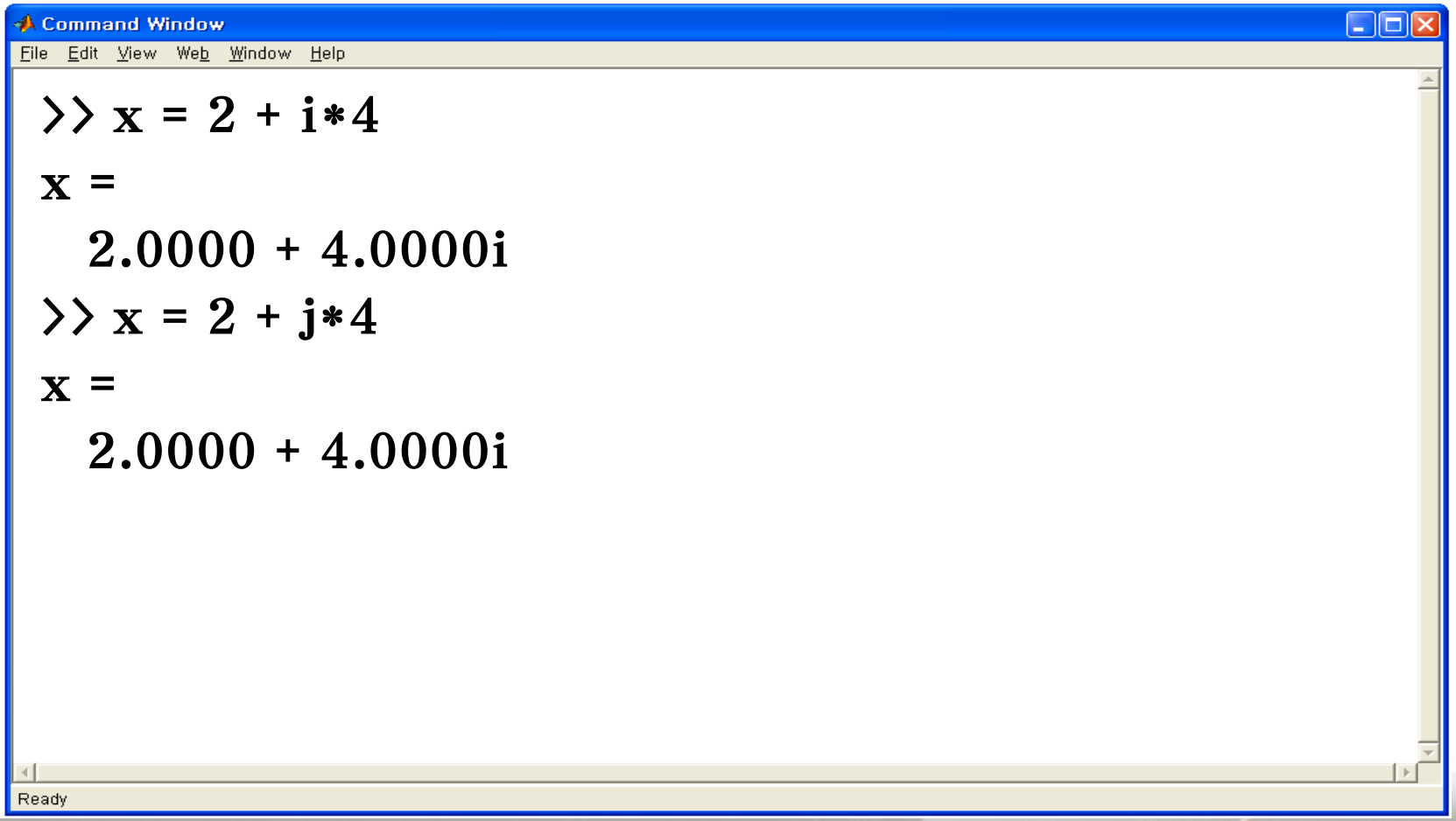
2.2 배정 (1/10)

[스칼라]


Command Window
File Edit View Web Window Help
>> a = 4
a =
4
>> A = 6;
>> a =4, A=6; x= 1;
a =
4
>> x
x =
1
Ready

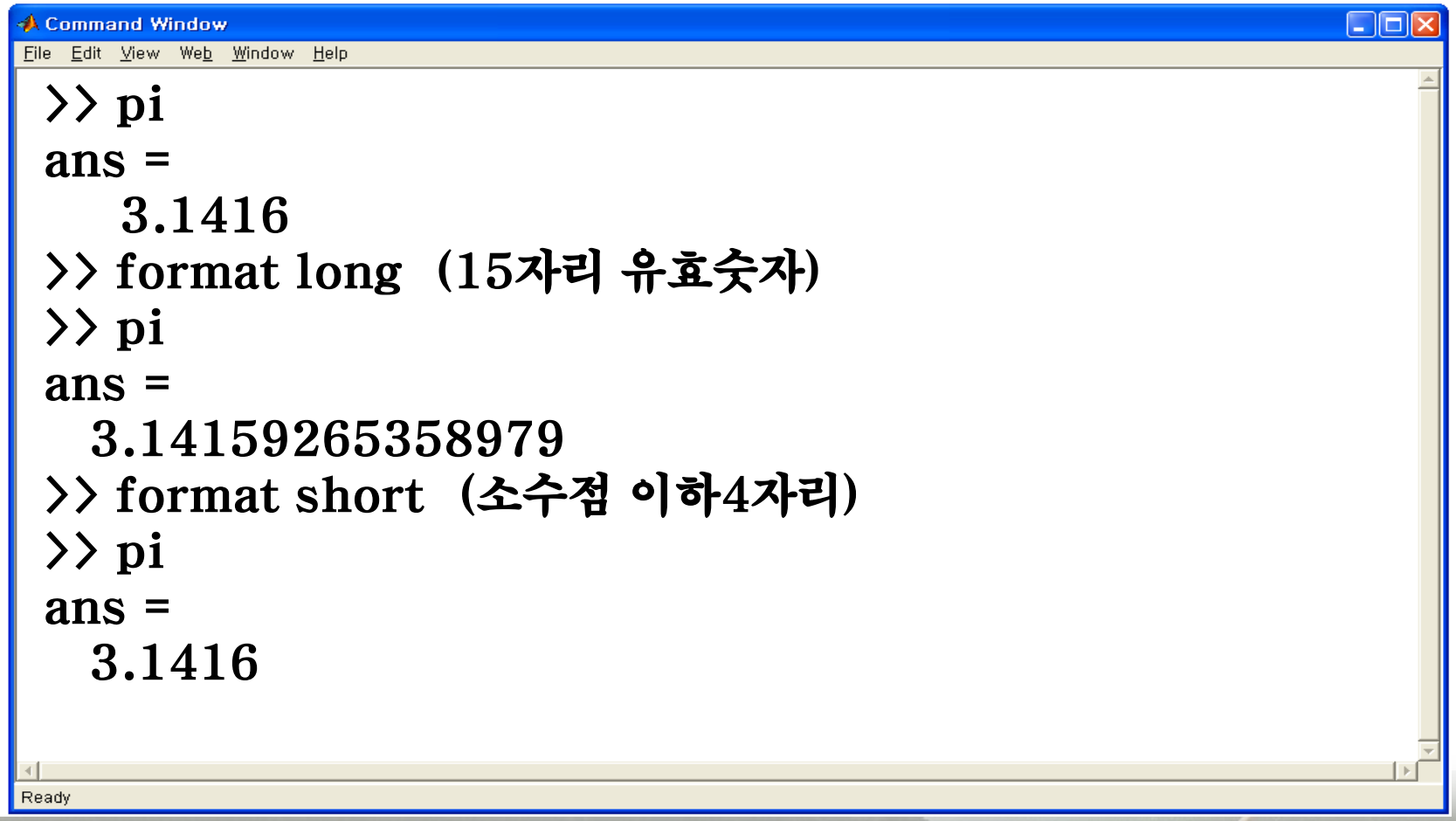
2.2 배정 (2/10)

[스칼라] 복소수



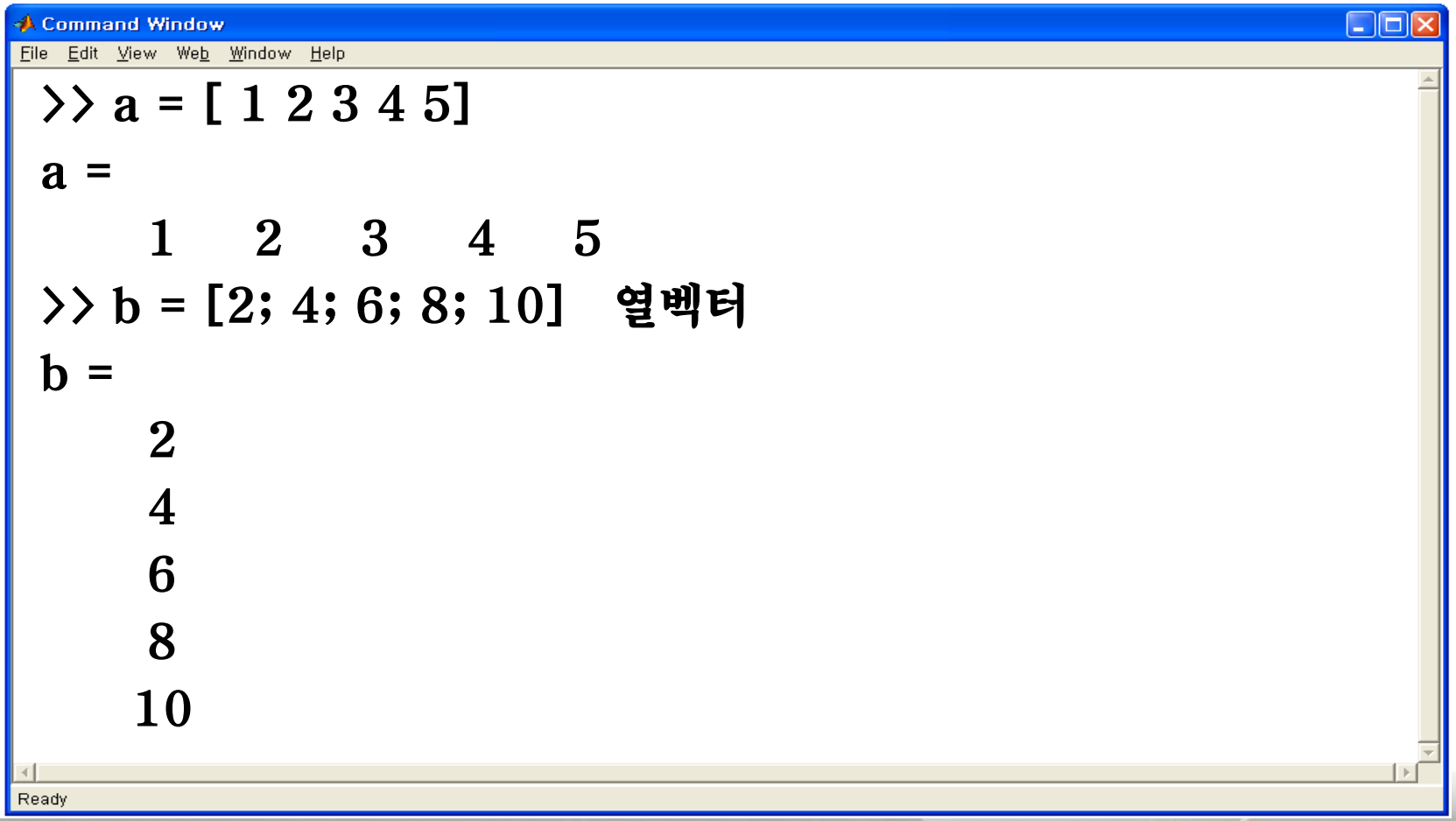
2.2 배정 (3/10)

[스칼라] 포맷 형태



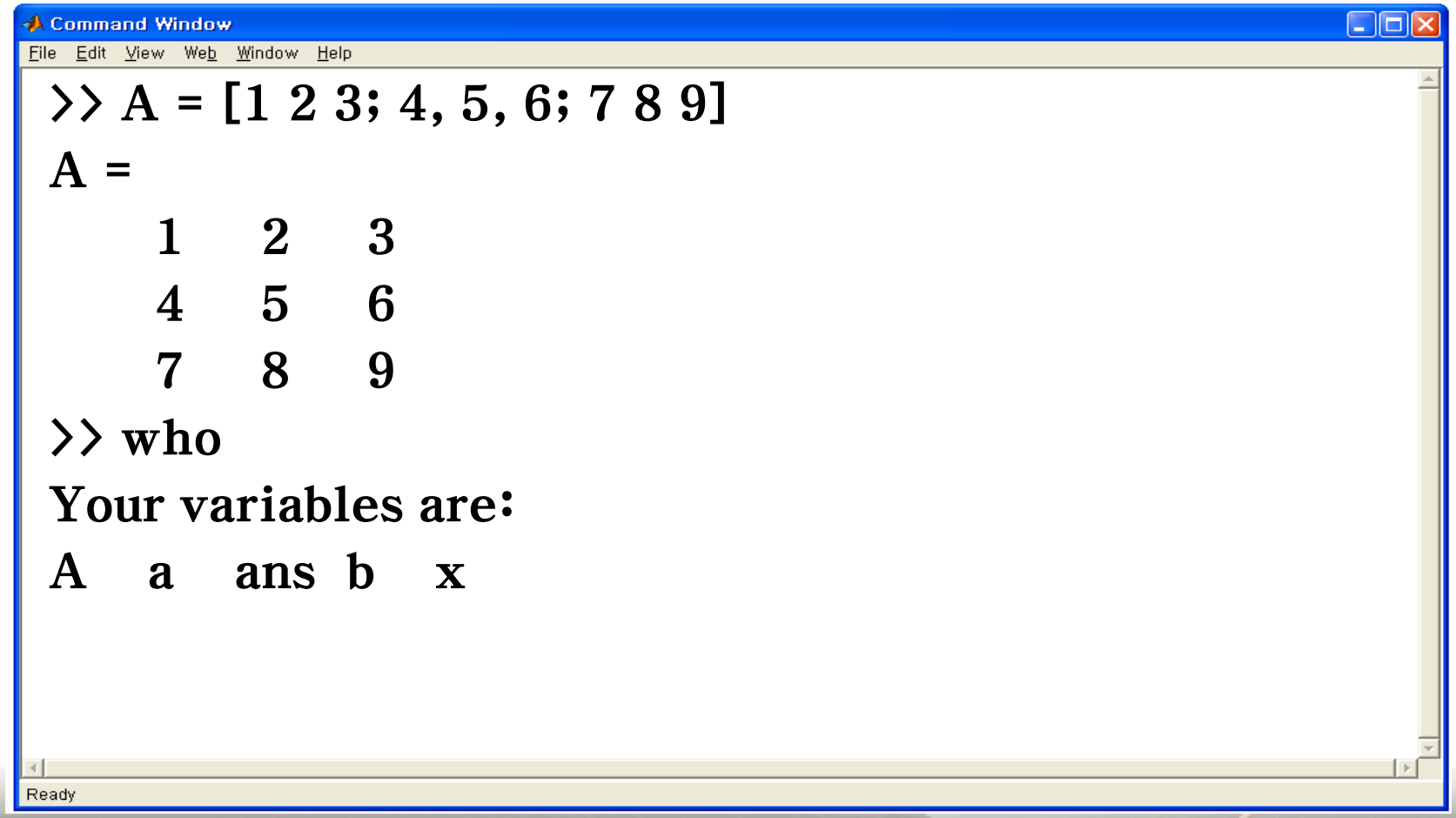
2.2 배정 (4/10)

[배열, 벡터와 행렬]



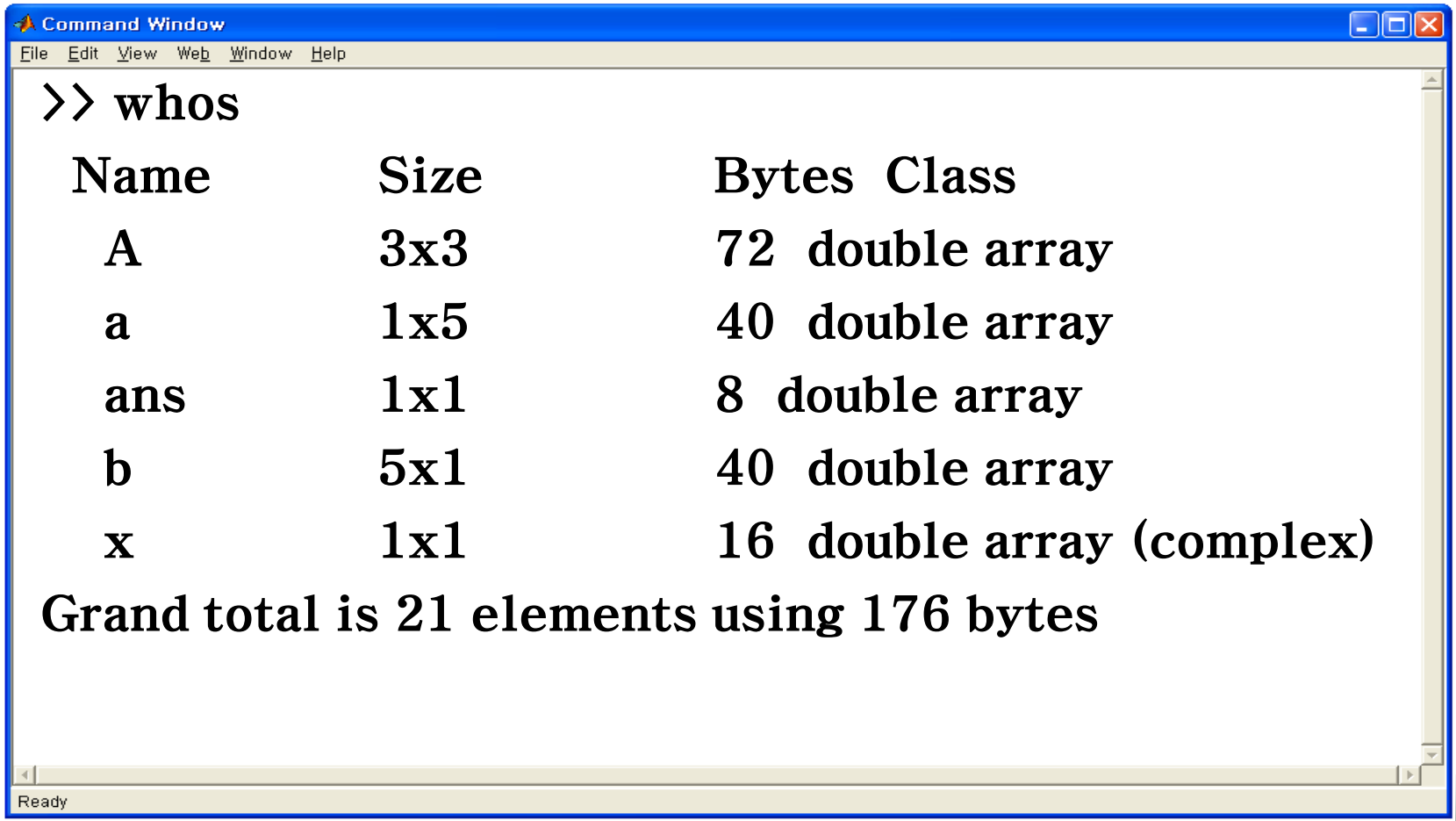
2.2 배정 (5/10)

[배열, 벡터와 행렬]



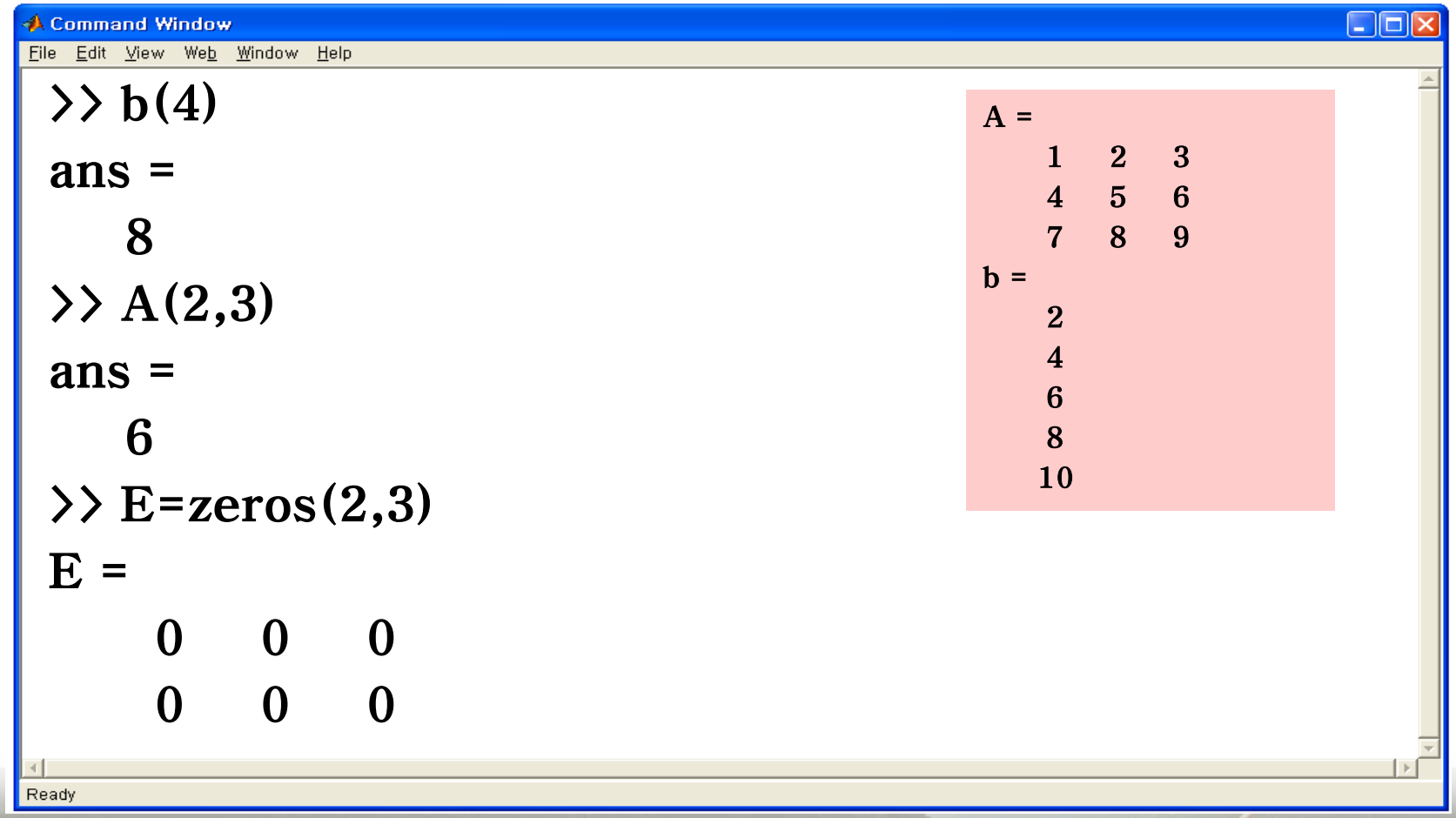
2.2 배정 (6/10)

[배열, 벡터와 행렬]



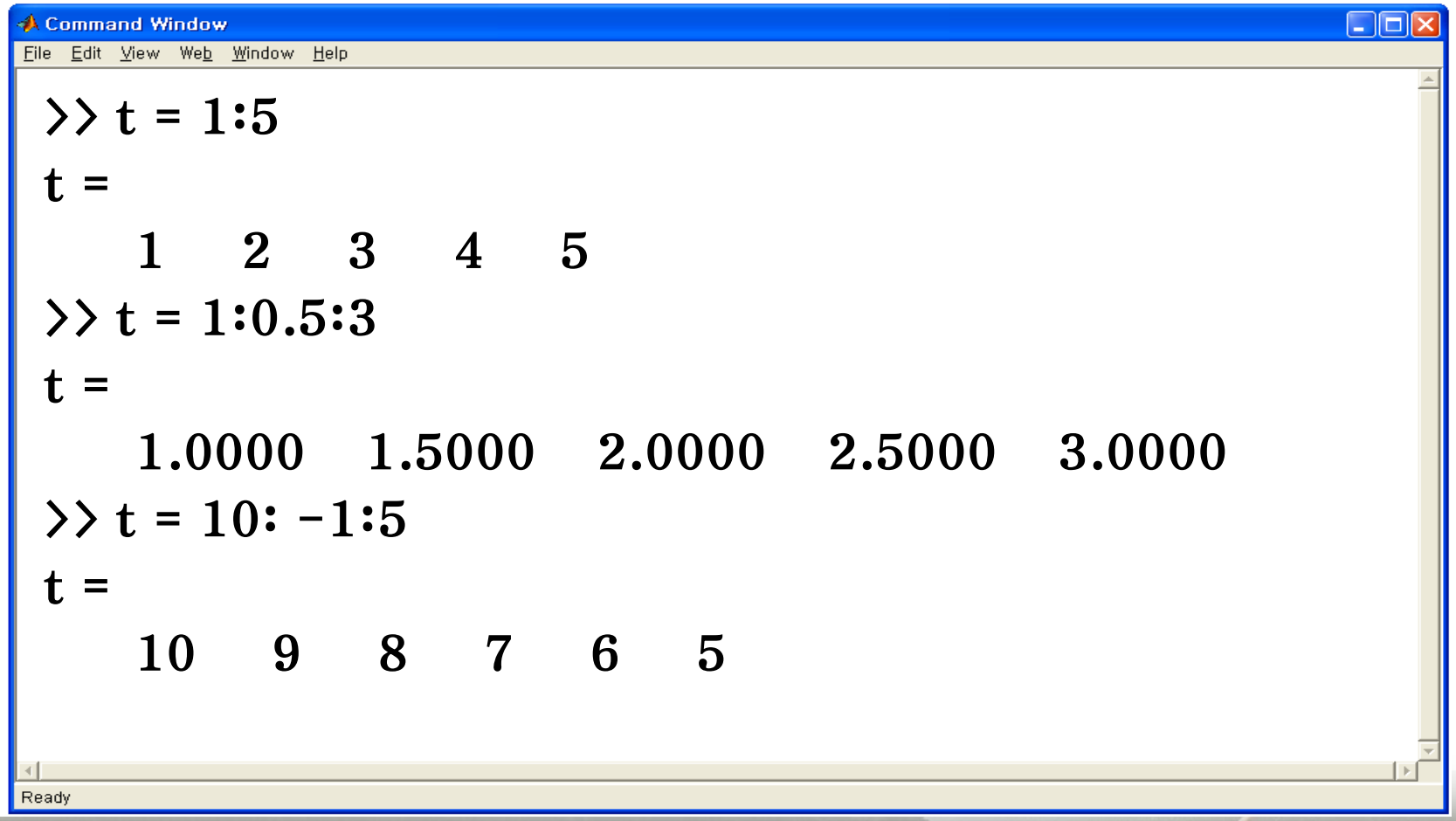
2.2 배정 (7/10)

[배열, 벡터와 행렬]



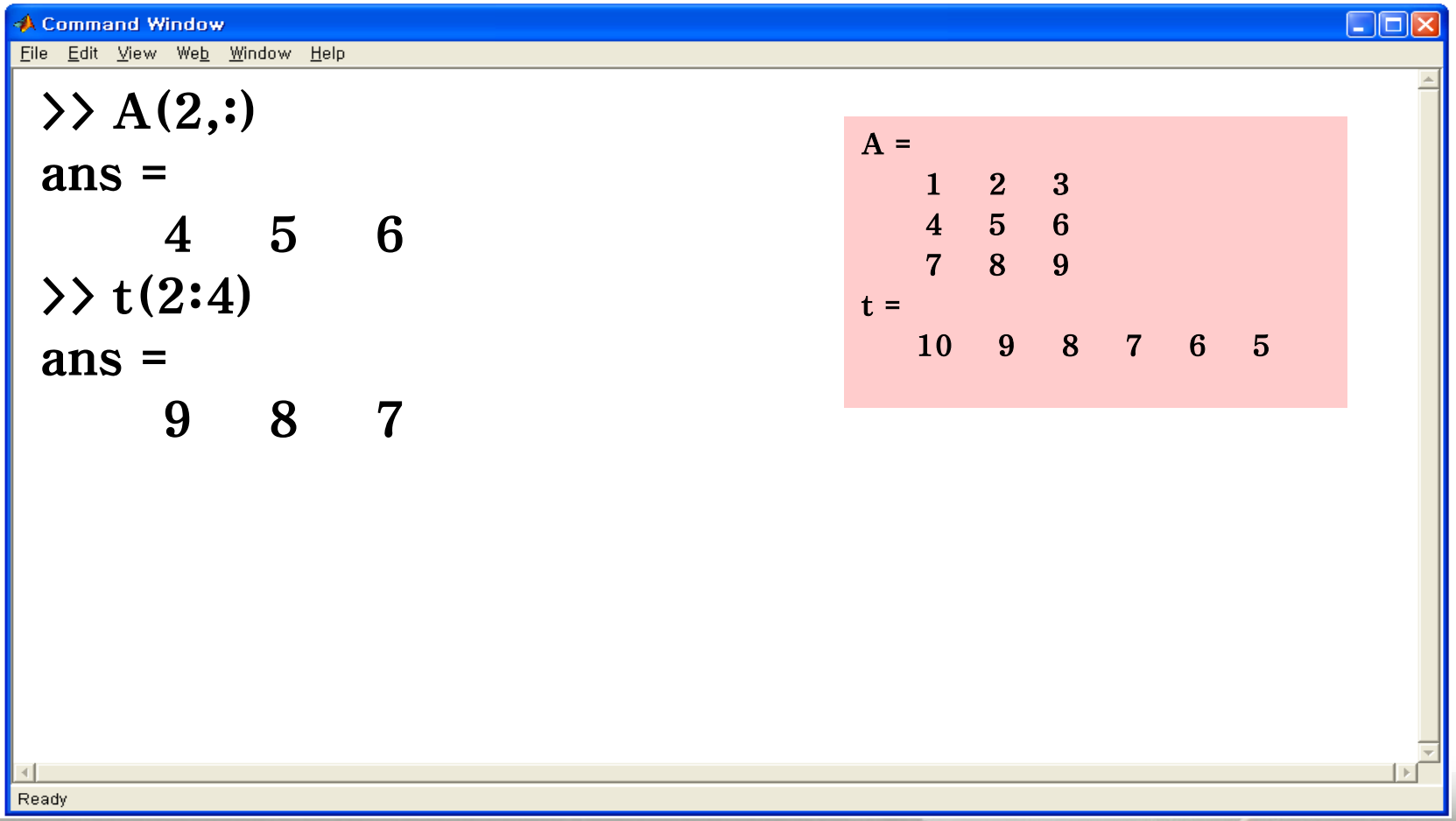
2.2 배정 (8/10)

[콜론 연산자]



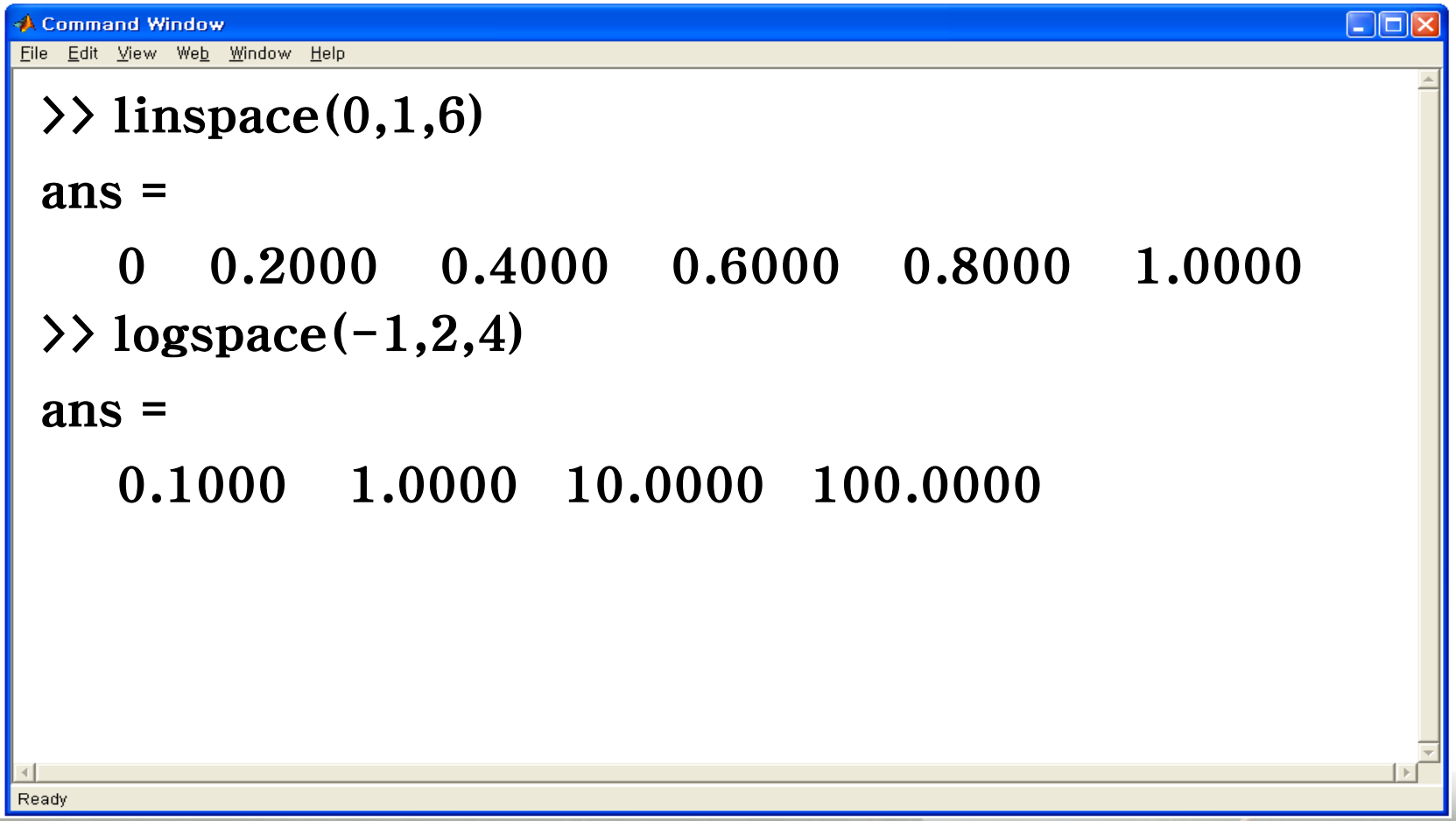
2.2 배정 (9/10)

[콜론 연산자]



2.2 배정 (10/10)

[linspace와 logspace 함수]

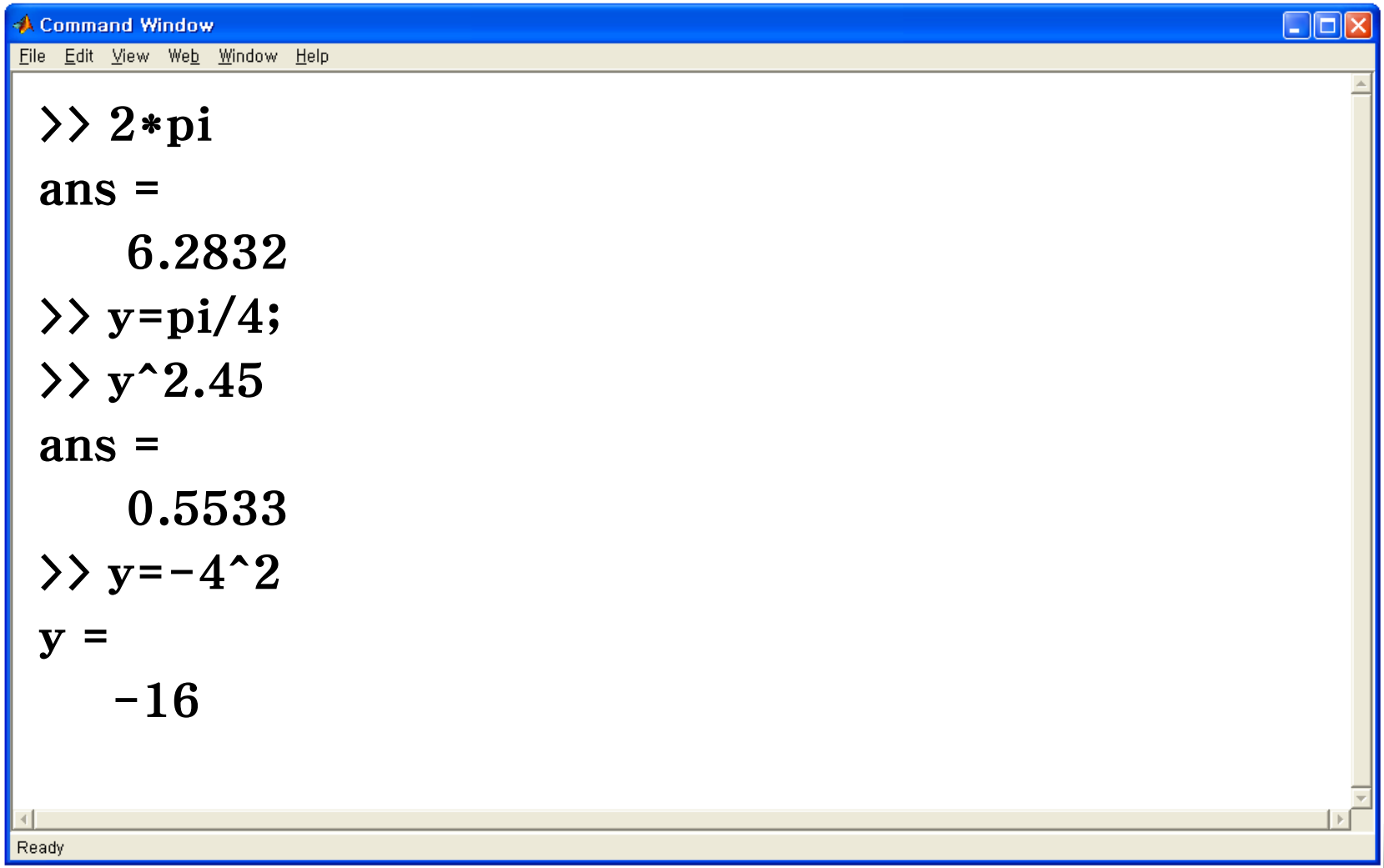


2.3 수학적 연산 [1/7]

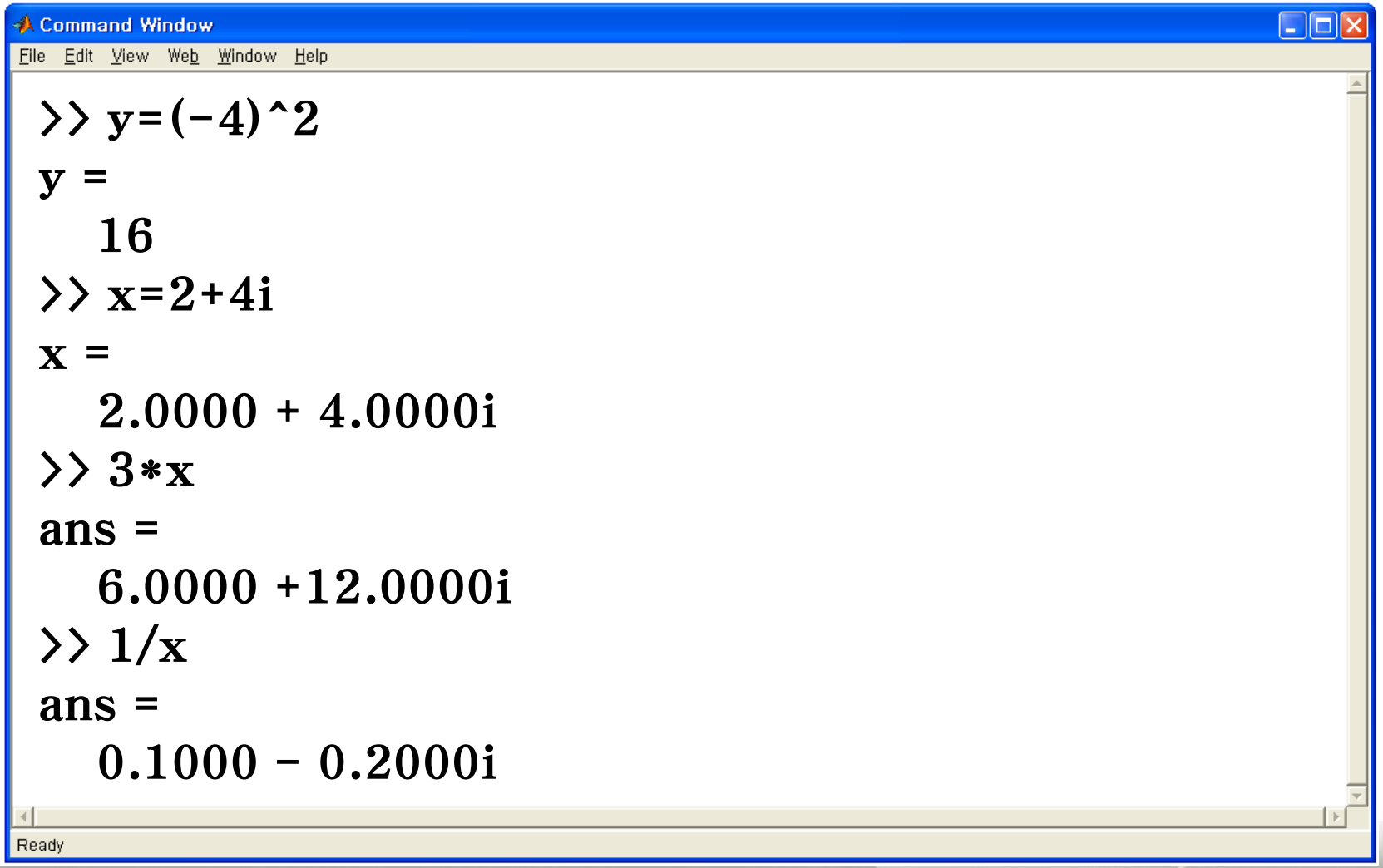
[계산순서]

- 지수계산 (^)
- 음부호 (-)
- 곱셈과 나눗셈 (*, /)
- 왼쪽 나눗셈 (\ )
- 덧셈과 뺄셈 (+, -)

2.3 수학적 연산 (2/7)


Command Window
File Edit View Web Window Help
>> 2*pi
ans =
6.2832
>> y=pi/4;
>> y^2.45
ans =
0.5533
>> y=-4^2
y =
-16
Ready

2.3 수학적 연산 (3/7)


Command Window
File Edit View Web Window Help
>> y=(-4)^2
y =
16
>> x=2+4i
x =
2.0000 + 4.0000i
>> 3*x
ans =
6.0000 +12.0000i
>> 1/x
ans =
0.1000 - 0.2000i
Ready

2.3 수학적 연산 (4/7)

Command Window

File Edit View Web Window Help

```
>> x^2
ans =
 -12.0000 +16.0000i
>> x+y
ans =
  18.0000 + 4.0000i

>> a=[1 2 3];
>> b=[4 5 6]';
>> A=[1 2 3; 4 5 6; 7 8 9];
```

```
x =
   2.0000 + 4.0000i
y =
   16
```

Ready

2.3 수학적 연산 (5/7)

Command Window

File Edit View Web Window Help

```
>> a*A
ans =
    30    36    42
>> A*b
ans =
    32
    77
   122
>> A*a
  ??? Error using ==> *
Inner matrix dimensions must agree.
```

```
a =
     1     2     3
b =
     4
     5
     6
A =
     1     2     3
     4     5     6
     7     8     9
```

Ready

2.3 수학적 연산 (6/7)

Command Window

File Edit View Web Window Help

```
>> A*A
ans =
    30    36    42
    66    81    96
   102   126   150
>> A/pi
ans =
    0.3183    0.6366    0.9549
    1.2732    1.5915    1.9099
    2.2282    2.5465    2.8648
```

```
A =
     1     2     3
     4     5     6
     7     8     9
```

Ready

2.3 수학적 연산 (7/7)

Command Window

File Edit View Web Window Help

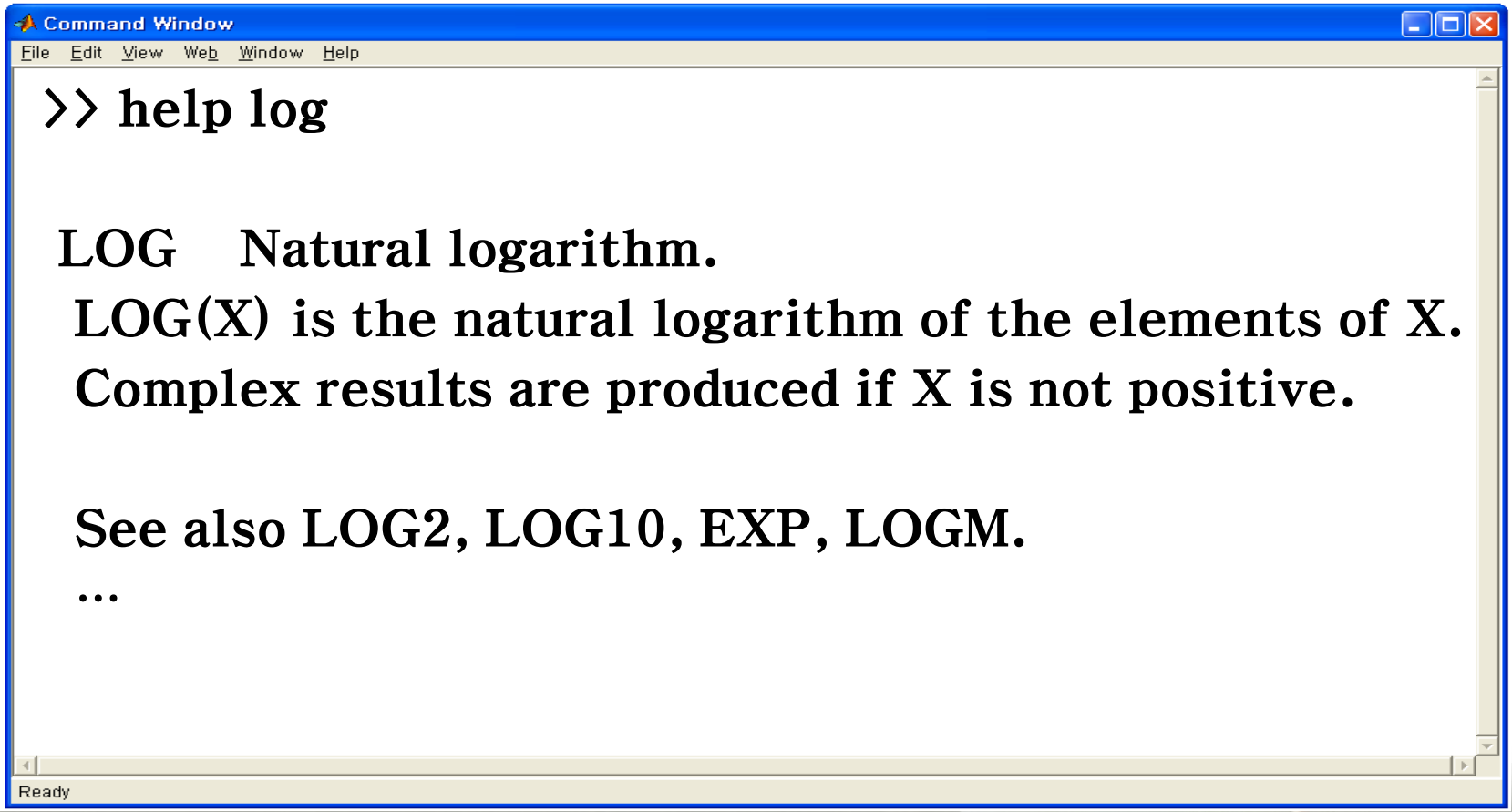
```
>> A^2  행렬의 곱

ans =
    30    36    42
    66    81    96
   102   126   150
>> A.^2 원소별 거듭제곱
ans =
     1     4     9
    16    25    36
    49    64    81
```

```
A =
     1     2     3
     4     5     6
     7     8     9
```

Ready

2.4 내장함수의 사용 (1/9)

- Help 명령어를 사용하여 온라인 도움을 얻음



2.4 내장함수의 사용 (2/9)

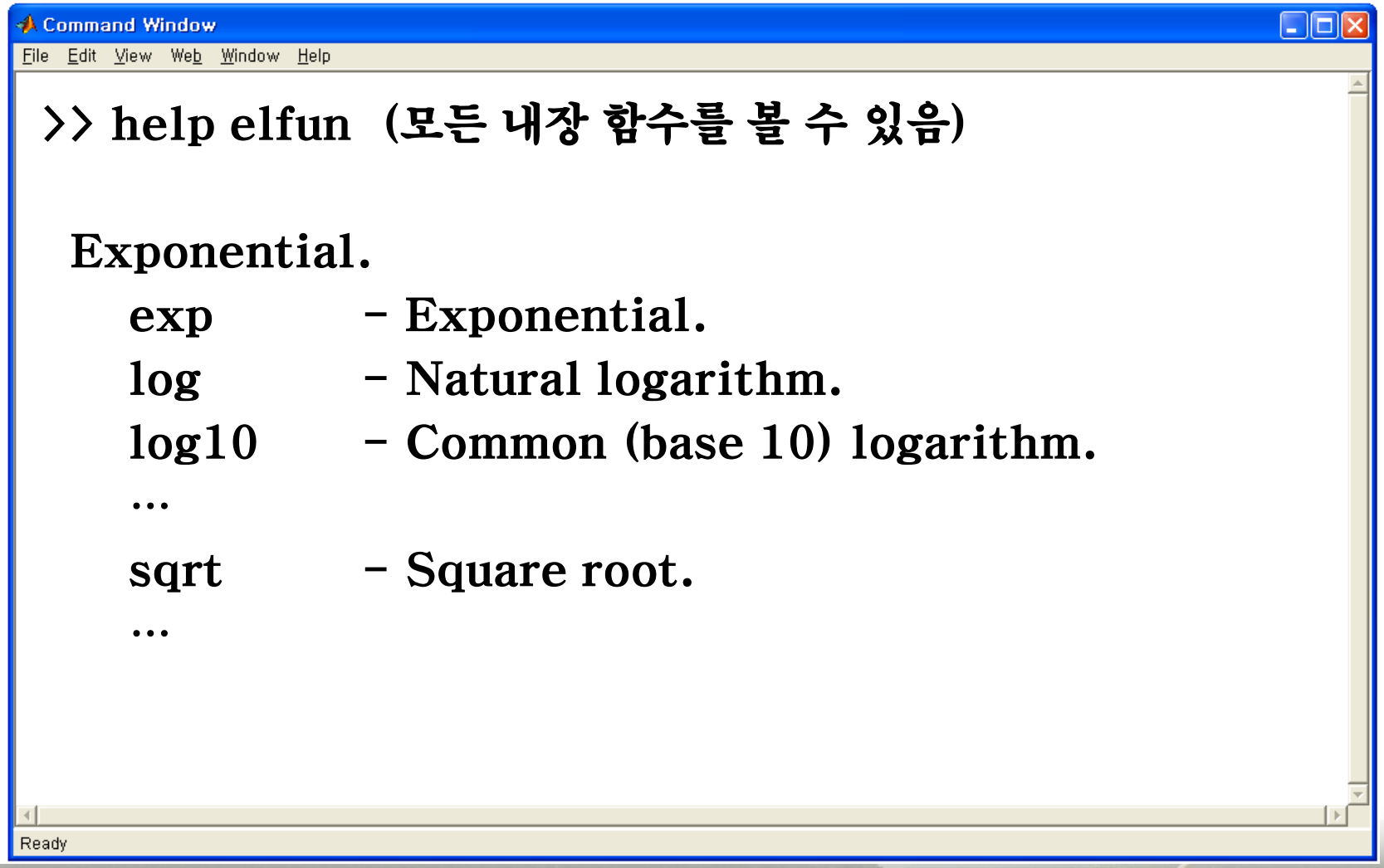
Command Window

File Edit View Web Window Help

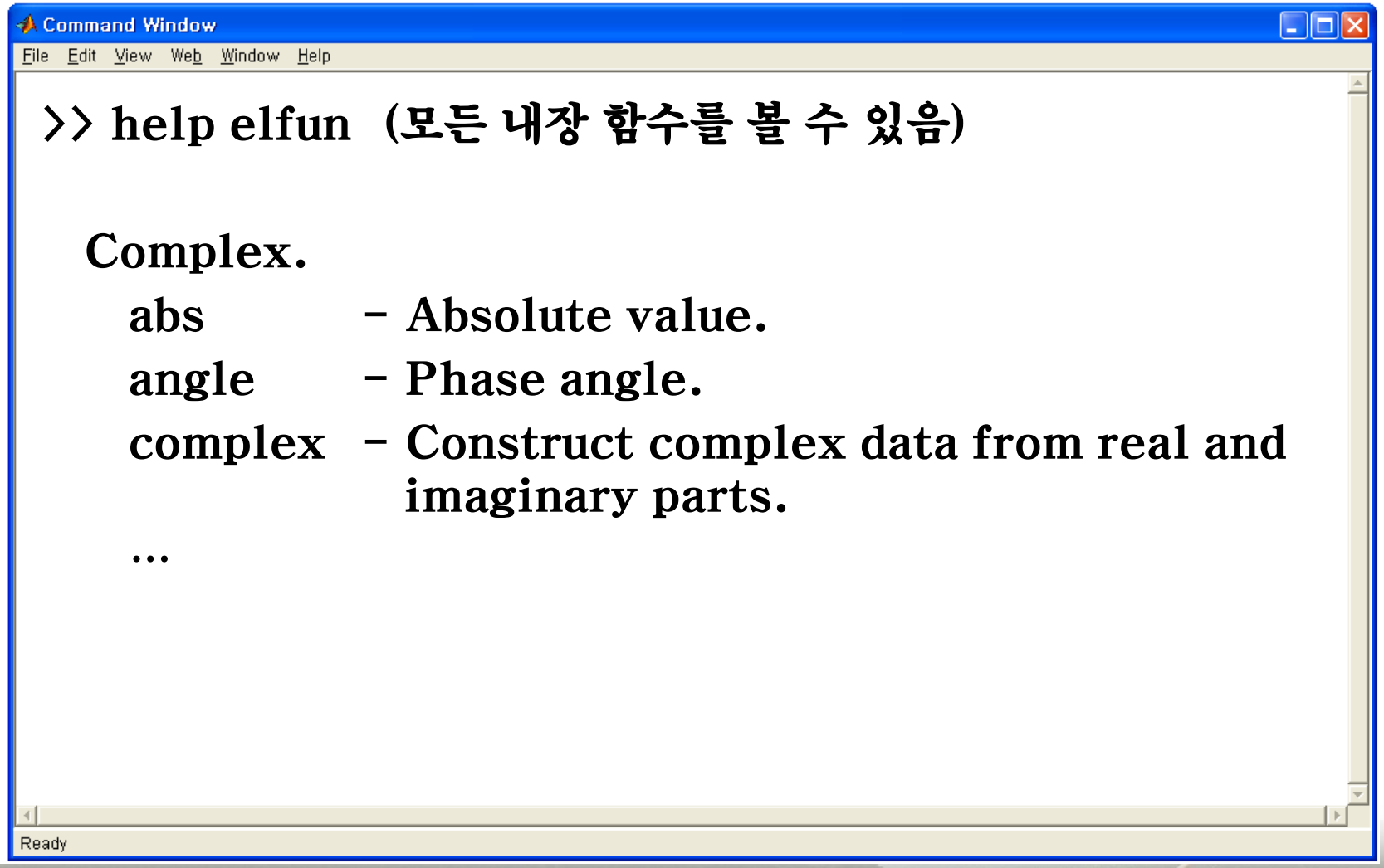
```
>> help elfun  (모든 내장 함수를 볼 수 있음)

  Elementary math functions.
  Trigonometric.
      sin         - Sine.
      sinh        - Hyperbolic sine.
      asin        - Inverse sine.
      asinh       - Inverse hyperbolic sine.
      cos         - Cosine.
      ...
```

Ready

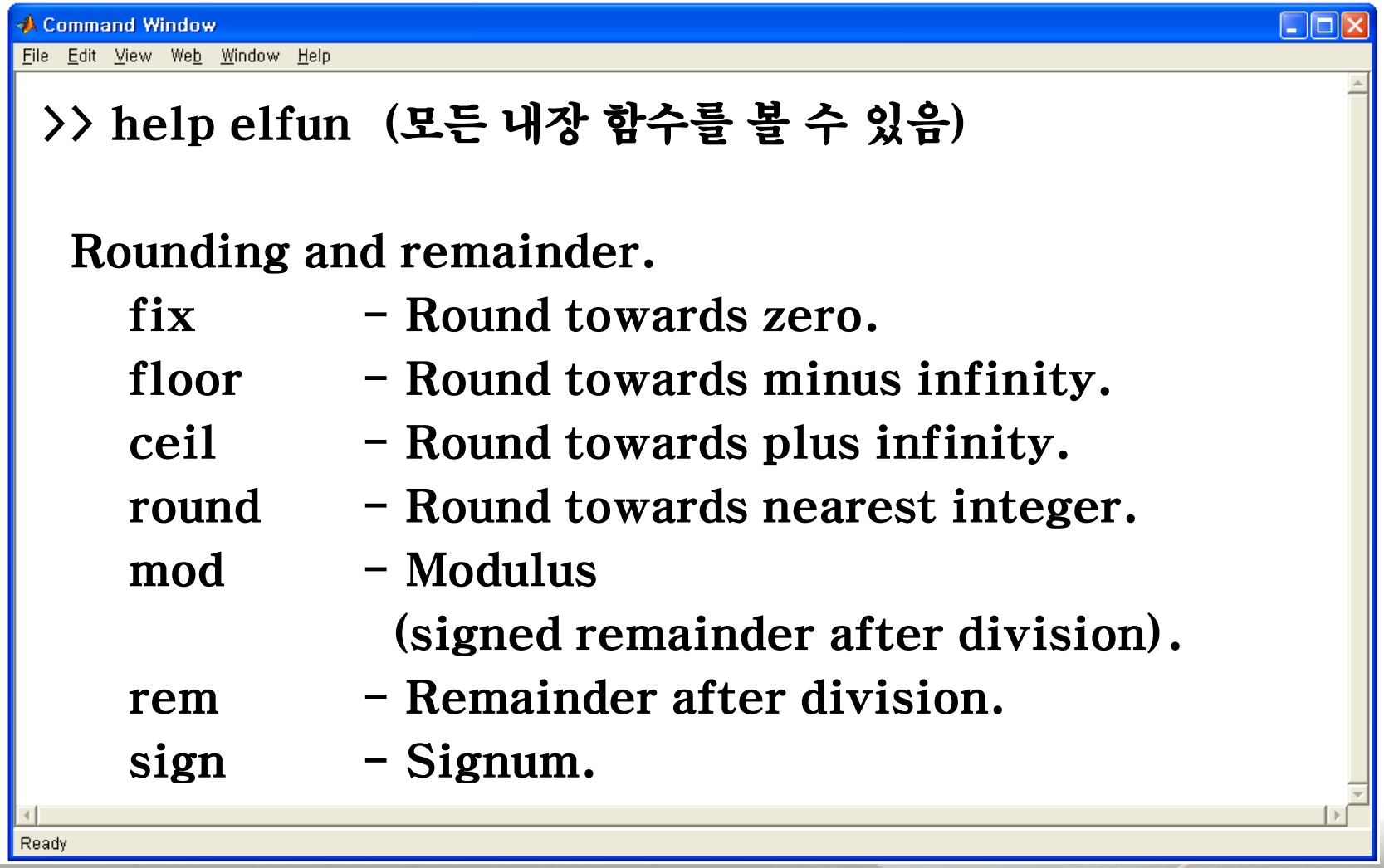
2.4 내장함수의 사용 (3/9)



2.4 내장함수의 사용 (4/9)



2.4 내장함수의 사용 (5/9)



2.4 내장함수의 사용 (6/9)

Command Window

File Edit View Web Window Help

```
>> sin(pi/2)
ans =
     1
>> exp(1)
ans =
    2.7183
>> abs(1+2i)
ans =
    2.2361
>> fix(1.9)      : FIX(X) rounds the elements of X to
                    the nearest integers towards zero.
ans =
     1
```

Ready

2.4 내장함수의 사용 (7/9)

Command Window

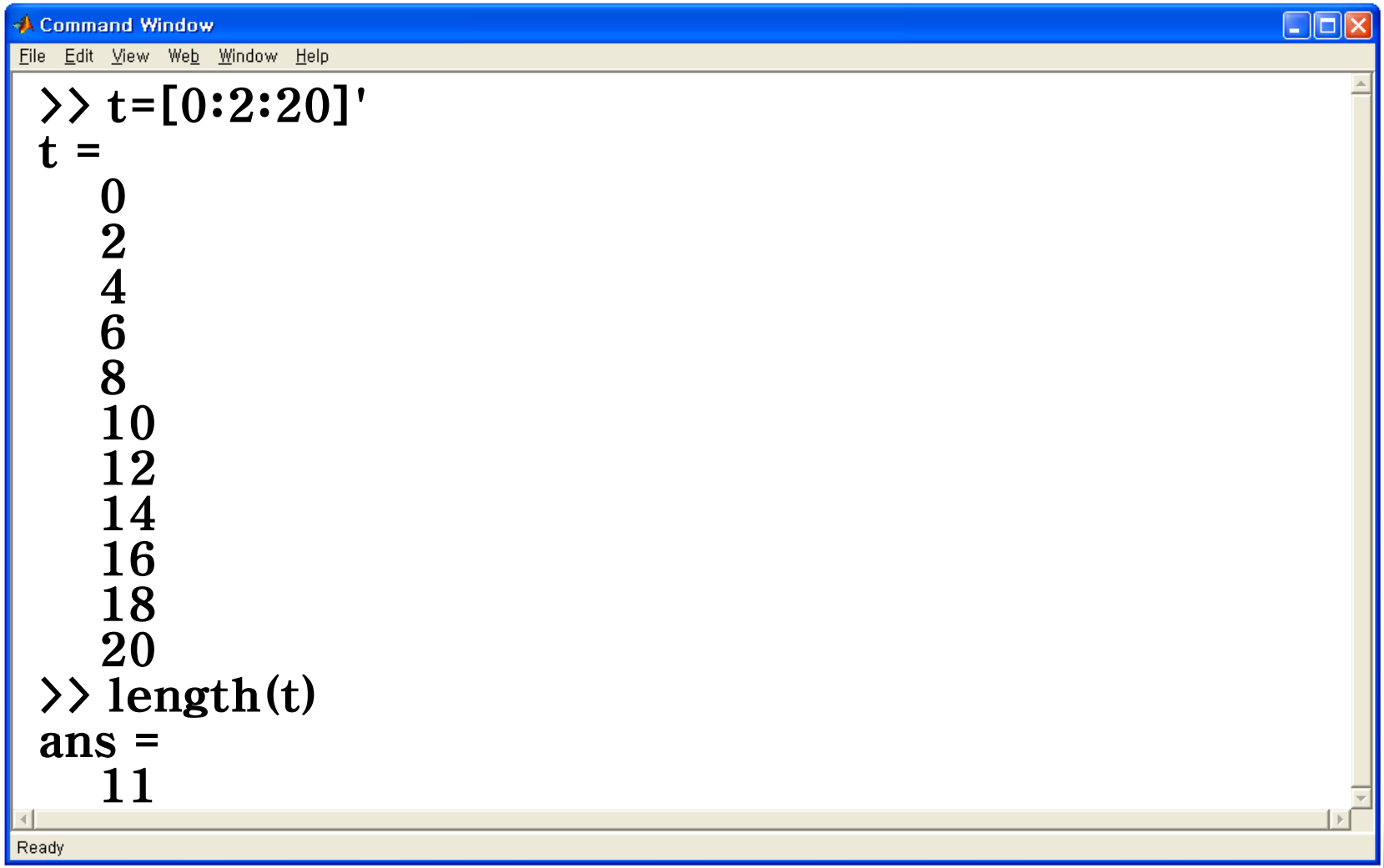
File Edit View Web Window Help

```
>> ceil(1.9)
ans =
     2
>> round(1.9)
ans =
     2
>> rem(7,3)  : remainder after division
ans =
     1
>> log(A)
ans =
         0    0.6931    1.0986
    1.3863    1.6094    1.7918
    1.9459    2.0794    2.1972
```

```
A =
     1     2     3
     4     5     6
     7     8     9
```

Ready

2.4 내장함수의 사용 (8/9)



2.4 내장함수의 사용 (9/9)

Command Window

File Edit View Web Window Help

```
>> g=9.81; m=68.1; cd=0.25;
>> v=sqrt(g*m/cd)*tanh(sqrt(g*cd/m)*t)
v =
         0
   18.7292
   33.1118
   42.0762
   46.9575
   49.4214
   50.6175
   51.1871
   51.4560
   51.5823
   51.6416
```

Ready

2.5 그래픽 (1/2)

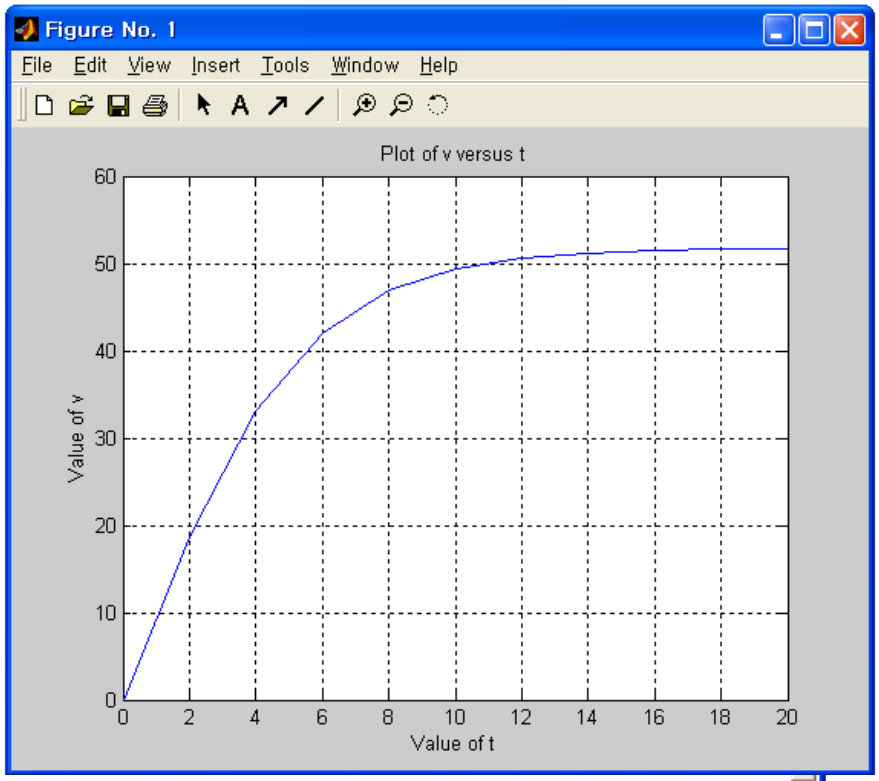
- 그래프를 빠르고 편리하게 그릴 수 있음

Command Window

File Edit View Web Window Help

```
>> plot(t,v)
>> title('Plot of v versus t')
>> xlabel('Value of t')
>> ylabel('Value of v')
>> grid
```

Ready



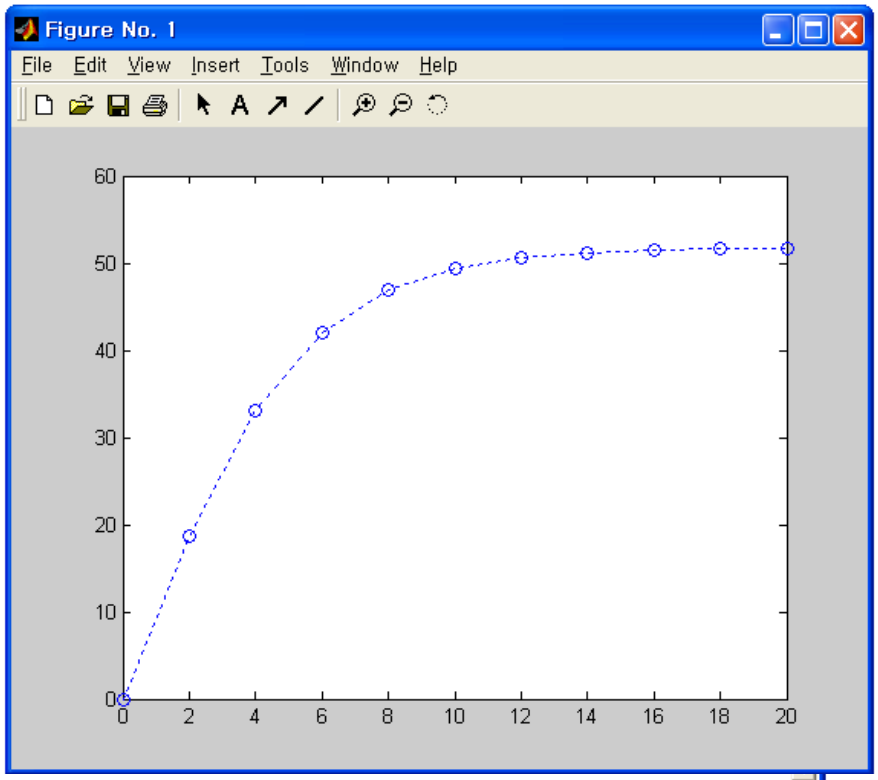
2.5 그래픽 (2/2)

- 그래프를 빠르고 편리하게 그릴 수 있음

Command Window

File Edit View Web Window Help

```
>> plot(t,v)
>> title('Plot of v versus t')
>> xlabel('Value of t')
>> ylabel('Value of v')
>> grid
>> plot(t,v,'bo:')
    % blue dotted line
    with circles on it (표 2.2 참조)
```



Ready