

# Solution

- 1 Evaluate following expressions, where  $a = -2$ ,  $b = 1$  and  $c = 1.5$ .

$$A = a + \frac{3b^2}{-a^3} + 2c - 1$$

$$B = \frac{(a + 3b)^2}{(-a^3 + 2)c}$$

```
>> a = -2;  
>> b = 1;  
>> c = 1.5;  
>> A = a+(3*b^2)/(-a^3)+2*c-1  
>> B = (a+3*b)^2/((-a^3+2)*c)
```

```
A =  
0.3750
```

```
B =  
0.0667
```

# Solution

- 2 Let  $m = 2.05$  g be a weight of yarn,  $l = 100$  m be a length of yarn. Find fineness of yarn  $T$  in [tex].

```
>> m = 2.05;  
>> l = 100;  
>> L = 100*0.001 % convert meters to kilometers  
>> T = m/L % fineness in tex unit
```

```
T =  
20.5000
```

# Solution

- 3 Let  $\rho_{SS} = 7500 \text{ kg/m}^3$  be a density of stainless steel and  $\rho_{PP} = 910 \text{ kg/m}^3$  be a density of polypropylene circular cross-sectional shape fiber. Find diameter  $d$  [ $\mu\text{m}$ ] of these fibers having fineness  $t = 2 \text{ dtex}$ .

```
>> rhoSS = 7500;
>> rhoPP = 910;
>> t = 2;
>> t = t*0.1; % covert dtex to tex
>> dSS = 2*sqrt(t)/sqrt(10^6*pi*rhoSS); %diameter in meters
>> dPP = 2*sqrt(t)/sqrt(10^6*pi*rhoPP); %diameter in meters
>> dSS = dSS*10^6 %diameter in micrometers

dSS =
    5.8269

>> dPP = dPP*10^6

dPP =
    16.7282
```

# Solution

- 4 Find the name of the function for calculating the sample variance

```
>> lookfor variance
```

```
cov                - Covariance matrix.  
movvar            - Moving variance value.  
var              - Variance.  
xcov             - Cross-covariance function estimates.  
...
```

```
>> help var
```

```
var Variance.
```

```
For vectors, Y = var(X) returns the variance of the values in X. For  
matrices, Y is a row vector containing the variance of each column of  
X. For N-D arrays, var operates along the first non-singleton  
dimension of X.
```

```
...
```

# Solution

- 5 Find the name of the function for calculating the correlation coefficient

```
>> lookfor correlation
```

```
corrcoef           - Correlation coefficients.  
xcorr              - Cross-correlation function estimates.  
randcorr          - Random correlation matrix with specified eigenvalues.  
  
...
```

```
>> help corrcoef
```

```
corrcoef Correlation coefficients.  
R=corrcoef(X) calculates a matrix R of correlation coefficients for  
an array X, in which each row is an observation and each column is a  
variable.  
  
...
```

# Solution

- 6 Find the name of the function for converting angles from radians to degrees

```
>> lookfor radians
acos          - Inverse cosine, result in radians.
asec          - Inverse secant, result in radians.
asin          - Inverse sine, result in radians.
atan          - Inverse tangent, result in radians.
cos           - Cosine of argument in radians.
cot           - Cotangent of argument in radians.
csc           - Cosecant of argument in radians.
deg2rad       - Convert angles from degrees to radians.
rad2deg       - Convert angles from radians to degrees.
sec           - Secant of argument in radians.

...
```

```
>> help rad2deg
rad2deg Convert angles from radians to degrees.
rad2deg(X) converts angle units from radians to degrees for each
element of X.

See also deg2rad.

Documentation for rad2deg
Other functions named rad2deg
```