**Sample programming challenges work with Numeric Expressions**

**PC3. Test Average**

Write a program that asks for five test scores. The program should calculate the average test score and display it. The number displayed should be formatted in fixed-point notation, with one decimal point of precision.  
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**PC12. Celsius to Fahrenheit**

Write a program that converts Celsius temperatures to Fahrenheit temperatures. The formula is

**F = 9 C +32  
 5**

F is the Fahrenheit temperature and C is the Celsius temperature. The program should prompt the user to input a Celsius temperature and should display the corresponding Fahrenheit temperature.

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**PC18. Interest Earned**

Assuming there are no deposits other than the original investment, the balance in a savings account after one year may be calculated as

**Amount = Principal \* (1 + Rate) T  
 T**

Principal is the balance in the account

Rate is the annual interest rate,

T is the number of times the interest is compounded during a year (e.g., T is 4 if the interest is compounded quarterly).

Write a program that asks for the principal, the interest rate, and the number of times the interest is compounded. It should display a report similar to the following:

Interest Rate: 4.25%

Times Compounded: 12

Principal: $ 1000.00

Interest: $ 43.33

Final balance: $ 1043.33

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**PC24. Planting Grapevines**

A vineyard owner is planting several new rows of grapevines, and needs to know how many grapevines to plant in each row. She has determined that after measuring the length of a future row, she can use the following formula to calculate the number of vines that will fit in the row, along with the trellis end-post assemblies that will need to be constructed at each end of the row: **V = R − 2E  
 S**  
The terms in the formula are:

V is the number of grapevines that will fit in the row.

R is the length of the row, in feet.

E is the amount of space, in feet, used by an end-post assembly.

S is the space between vines, in feet.

Write a program that makes the calculation for the vineyard owner. The program should ask the user to input the following:

The length of the row, in feet

The amount of space used by an end-post assembly, in feet

The amount of space between the vines, in feet

Once the input data has been entered, the program should calculate and display the number of grapevines that will fit in the row.

**/\* -----PC3 Pseudocode algorithm----**

Store numberofTests, testscore1, testScore2, testScore3, testScore4, testScore5, testScoreAvg

Prompt for and get input for the five test scores

testScoreAvg = (testScore1 + testScore2 + testScore3 + testScore4 + testScore5) / numberofTests ;

Display testScoreAvg

**\*/**

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**/\* -----PC12 Pseudocode algorithm----**

Store Celsius, Fahrenheit

Prompt for and get input for Celsius

Fahrenheit = ((9/5)\*Celsius) +32

Display Fahrenheit

**\*/**

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**/\* -----PC18 Pseudocode algorithm----**

Store principal=1000

Store intRate=0.0425

Store times=12

Store intEarned

Prompt for and get input principal, intRate, times

Calculate finalBal

finalBal=principal \*power(1 + (intRate/times), times)

intEarned=finalBal-principal

intPct=intRate\* 100

Display items

Interest Rate

Times Compounded

Principal

Interest Earned

Final Balance in Savings

**\*/**

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**/\* -----PC24 Pseudocode algorithm----**

store vines,rowLength,endPostLength,spaceBetweenVines

Prompt for and get input for rowLength, endPostLength, spaceBetweenVines

Calculate the number of vines

vines = (rowLength - 2 \* endPostLength) / spaceBetweenVines

Display number of vines in a row

**\*/**