Variables, Types, Operators & Expressions

Exercises and Solutions

Software Development 1 (F27SA)

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Week 2, lecture 1

Exercise

Complete this program so that it correctly calculates the formula $y = \frac{-1+ax^2+bx}{a(b+x)}$

EquationExercise.java

```
public class EquationExercise {
   public static void main(String[] args) {
      double x = 10.5, a = 2.5, b = 10;
      double y = <add code here>
      System.out.println("y="+y);
   }
}
```

Correct Solution

Complete this program so that it correctly calculates the formula $y = \frac{-1+ax^2+bx}{a(b+x)}$

```
public class EquationExercise {
   public static void main(String[] args) {
      double x = 10.5, a = 2.5, b = 10;
      double y = (-1 + a*x*x + b*x)/(a*(b+x));
      System.out.println("y="+y);
   }
}
```

Correct Solution

Complete this program so that it correctly calculates the formula $y = \frac{-1+ax^2+bx}{a(b+x)}$

```
public class EquationExercise {
   public static void main(String[] args) {
      double x = 10.5, a = 2.5, b = 10;
      double y = (-1 + a*x*x + b*x)/(a*(b+x));
      System.out.println("y="+y);
   }
}
```

You need these parentheses since / has higher precedence than the +s in the first part of the expression

Correct Solution

Complete this program so that it correctly calculates the formula $y = \frac{-1+ax^2+bx}{a(b+x)}$

```
public class EquationExercise {
   public static void main(String[] args) {
      double x = 10.5, a = 2.5, b = 10;
      double y = (-1 + a*x*x + b*x)/(a*(b+x));
      System.out.println("y="+y);
   }
}
```

You need these parentheses since otherwise / will be applied before this part of the expression is calculated

Correct Solution

Complete this program so that it correctly calculates the formula $y = \frac{-1+ax^2+bx}{a(b+x)}$

```
public class EquationExercise {
   public static void main(String[] args) {
      double x = 10.5, a = 2.5, b = 10;
      double y = (-1 + a*x*x + b*x)/(a*(b+x));
      System.out.println("y="+y);
   }
}
```

You don't need parentheses around these bits because * gets applied before the surrounding +s

Correct Solution

Complete this program so that it correctly calculates the formula $y = \frac{-1+ax^2+bx}{a(b+x)}$

```
public class EquationExercise {
   public static void main(String[] args) {
      double x = 10.5, a = 2.5, b = 10;
      double y = (-1 + a*x*x + b*x)/(a*(b+x));
      System.out.println("y="+y);
   }
}
```

This is the easiest (and most efficient) way to calculate squares. You can use Math.pow(a,b) for higher powers.

Incorrect Solution

Complete this program so that it correctly calculates the formula $y = \frac{-1+ax^2+bx}{a(b+x)}$

```
public class EquationExercise {
   public static void main(String[] args) {
      double x = 10.5, a = 2.5, b = 10;
      double y = -1 + a*x*x + b*x / a*(b+x);
      System.out.println("y="+y);
   }
}
```

$-1+ax^2+\frac{bx}{a}(b+x)$

Incorrect Solution

Complete this program so that it correctly calculates the formula $y = \frac{-1+ax^2+bx}{a(b+x)}$

```
public class EquationExercise {
   public static void main(String[] args) {
      double x = 10.5, a = 2.5, b = 10;
      double y = -1 + a*x*x + b*x / (a*(b+x));
      System.out.println("y="+y);
   }
}
```

$-1+ax^2+\frac{bx}{a\,(b+x)}$

Incorrect Solution

Complete this program so that it correctly calculates the formula $y = \frac{-1+ax^2+bx}{a(b+x)}$

```
public class EquationExercise {
   public static void main(String[] args) {
      double x = 10.5, a = 2.5, b = 10;
      double y = (-1 + a*x*x + b*x) / a*(b+x);
      System.out.println("y="+y);
   }
}
```

$\frac{-1+ax^2+bx}{a}(b+x)$

Quiz

Which of these are valid Java expressions?

A. `int count = 55 + (12/4);`

B. `int i = 55.5 * 1000.0;`

C. `int n = 100++;`

D. `String pre = "I " + "ate ";`

E. `String post = count + " pies";`

F. `String sentence = pre + post`

Quiz

Which of these are valid Java expressions?

A. `int count = 55 + (12/4);` ✓

B. `int i = 55.5 * 1000.0;` ✗ needs a cast

C. `int n = 100++;` ✗ ++ only works on variables

D. `String pre = "I " + "ate ";` ✓

E. `String post = count + " pies";` ✓

F. `String sentence = pre + post` ✗

missing semi-colon