

The exam is taken without any material beside writing material, and in silence. Answer the following questions and problems, trying to be as clear and as accurate as possible. Take the time to read carefully the statements before trying to answer them. You can write on the back of your test, in which case you're asked to indicate it clearly. This exam has 6 problems, for a total of 110 points.

### Problem 1

Write a statement that ...

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- a) ...creates a variable `myName` of type `string`.
- b) ...assigns the value 31.5 to a `float` variable called `age`.
- c) ...creates a `Rectangle` object called `rect`.
- d) ...creates an `decimal` variable called `milesWalked` and sets its value to 4.5.

Then, indicate which one (i.e., a), b), c) or d)) is

- *an instantiation:*
- *an assignment:*
- *an initialization:*
- *and a declaration:*

**Problem 2**

For each of the following, indicate the value of myVar after the statement has been executed, or indicate if there would be an error and explain it:

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a) `double` myVar = 20 / 2.0;

e) `int` myVar = (`int`) 10 / 2.0;

b) `int` myVar = 20 / 2;

f) `int` myVar = (`int`)(3 / 2.0);

c) `float` myVar = 10F \* 3.0;

g) `double` myVar = 4 \* 2.0 / 10 + 1;

d) `double` myVar = 3 + 8 / 2.0;

h) `decimal` myVar = 12.3M -1;

**Problem 3**

For each of the following statements, indicate what would be displayed on the screen, assuming that myVar is an `int` variable whose value is 12. Explicitly indicate spaces as `␣` and new lines as `↵`.

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```
Console.Write(myVar);
```

```
Console.WriteLine($"{myVar}");
```

```
Console.Write("myVar");
```

```
Console.Write("$" + myVar);
```

```
Console.Write($"{myVar:C}");
```

```
Console.Write("I'm " + myVar + ".");
```

```
Console.WriteLine($"I computed {myVar * 2}.");
```

```
Console.WriteLine(myVar + " + 2 = " + (myVar + 2));
```

**Problem 4**

Answer the following short exercises:

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1. Evaluate the following expressions (you can indicate the intermediate steps if you want):

```
1 + 2 * 3
```

```
2 / 2 + 1
```

```
(2.5 * 2) + 4 / 2 * 4
```

```
2 - 3 + 2 % 4
```

```
4 / 2 + 1 * 7
```

```
3 + 5 * 2 - 3
```

2. Give four different reserved words (a.k.a. keywords).

3. Give four examples of valid identifiers.

4. Write a statement that would convert the content of a **string** called `userInput` into a **decimal**, and store it in a **decimal** variable called `mySavings`. Then, answer the following: what would happen if the content of `userInput` was "I don't have any."?

**Problem 5**

Write a program that asks the user their name, their age (in years), and displays at the screen the name they entered, followed by their age in days. You should consider that a year is 365.25 days, to account for leap years, but display only a whole number.

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Two examples of execution, where the user input is underlined, and hitting “enter” is represented by ↵, are:

```
Enter your name, followed by enter.  
Baby Blue ↵  
Enter your age, followed by enter.  
1 ↵  
Baby Blue, you are 365 days old!
```

```
Enter your name, followed by enter.  
Mary ↵  
Enter your age, followed by enter.  
5 ↵  
Mary, you are 1826 days old!
```

```
using System;  
class Welcome{  
    static void Main(){
```

```
    }  
}
```

**Problem 6**

Consider the following class definition for bottles:

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```
class Bottle{  
    private string content; // To hold a description of the content.  
    private int oz; // To hold the capacity in ounces.  
}
```

1. Let us improve this class by adding some methods.

(a) Write the get method for the oz attribute.

(b) Write the set method for the content attribute.

(c) Write a method that returns (as a real number) the capacity of the calling object in pint, knowing that 1 pint is 16 fluid oz.

2. Now, let us assume that we want to use this class in a `Main` method.

(a) Write a statement that creates an object from this class and assign it to a variable.

(b) Write a statement that displays on the screen the capacity in ounces of a **Bottle** object named `myBottle`.

(c) Write statements that ask the user to enter a content description, and sets the content attribute of a **Bottle** object called `myBottle` to the value entered.

(d) Write a statement that displays on the screen the capacity in pints of a **Bottle** object named `myBottle`.  
You should use the method you defined at the previous step to do so.