

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

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

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

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:

_____/10 p.

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 ↵.

_____/10 p.

```
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

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Answer the following short exercises:

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

Complete the following code (you only have to add statements in the body of the Main method), so that your program would

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1. Ask the user how many glasses of lemonade they want,
2. Ask the user how many cookies they want,
3. Display (nicely!) on the screen the total price, knowing that glasses of lemonade are \$1 each, cookies are \$1.50 each, and that the sales taxes are 10% of the total.

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

How many glasses of lemonade do you want?

1 ↵

How many cookies do you want?

2 ↵

Your total is \$4.40!

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

```
    }
}
```

Problem 6

Consider the following class definition for items:

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```
class Item{  
    private decimal price;      // To hold the price of the item.  
    private string description; // To hold a description of the item.  
}
```

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

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

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

(c) Write a method that takes a quantity as an `int` argument, and returns the price for that quantity of calling object.

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 (nicely!) on the screen the price of an **item** object named `myitem`.

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

(d) Write a statement that displays on the screen the price of five pieces of an **item** object named `myitem`.
You should use the method you defined at the previous step to do so.