ACSL

**American Computer Science League**

**2012 - 2013**

#### All-Star #1

**ACSL Gold**

**PROBLEM**: With the price of gold so high the last few years, many people have gathered up broken and unused jewelry to sell at jewelry stores or gold buying stores. It is difficult to determine if a person is getting a fair price for the gold since buyers use several different measurement scales and those scales are not normally found in the home. Buyers use weights called grains, troy weight and penny weight while most home scales are in ounces and grams. Further, the purity of the gold, measured in units called carats, must be considered. Then buyers charge a percentage of the value because the gold jewelry must be processed into bars before it can be sold. In this program you will determine the price a person will get for his gold.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Grains | Grams | Penny | Troy | Ounces |
| Grains | 1 | 0.0648 | 0.0417 | 0.0021 | 0.0023 |
| Grams | 15.4324 | 1 | 0.6430 | 0.0321 | 0.0353 |
| Penny | 24.0000 | 1.5552 | 1 | 0.0500 | 0.0549 |
| Troy | 480.0000 | 31.1035 | 20.0000 | 1 | 1.0971 |
| Ounces | 437.5000 | 28.3495 | 18.2292 | 0.9115 | 1 |

Using the table above, it is possible to determine that 1 ounce is equal to 18.2292 penny weight and that 1 gram is equal to 0.0321 troy weight.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Carats | 24 | 22 | 18 | 14 | 12 | 8 | 6 | 1 |
| % Gold | 100 | 91.7 | 75 | 58.3 | 50 | 33.3 | 25 | 4.167 |

Using the purity chart above, a ring that weighs 1 ounce but is labeled as 18 carat only contains 0.75 ounces of gold.

**INPUT:** There will be 6 lines of input. The first line will give the dollar price of 1 troy weight of gold. The next 5 lines will give the weight of the gold, the units used for that weight, the purity of the gold in carats and the buyers percentage. The weight units will be 2-character strings as follows: GN, GM, PN, TR, ON in the order shown in the first chart.

**OUTPUT:** For each input on lines 2 - 6 print the amount a person would get from the buyer. All answers must printed in dollar and cents format and be round to two decimal places. In standard arithmetic rounding 0 - 4 leaves the digit to the left alone and 5 - 9 increases that digit by 1.

SAMPLE INPUT SAMPLE OUTPUT  
1. 1675.38  
2. 240, GN, 24, 20 1. 675.51  
3. 6, GM, 12, 30 2. 112.94  
4. 25, PN, 18, 36 3. 1005.23  
5. 3.5, ON, 6, 25 4. 1002.17  
6. 8, TR, 22, 33 5. 8234.69

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TEST DATA**

**TEST INPUT TEST OUTPUT**

1. 1249.37  
 2. 25, TR, 1, 17.5 1. 1073.76  
 3. 64, GM, 14, 25 2. 1122.29  
 4. 593, GN, 24, 30 3. 1089.09  
 5. 310, PN, 8, 20 4. 5158.90  
 6. 3.5, ON, 22, 16.67 5. 3045.70