Targets

I can:

- take a competency test

Taking Programming Competency Tests

All competency tests are done by hand on a piece of paper with pen or pencil. You may assume that the header files and main() are already included in the code. You may also assume that any variables given have been properly declared. They should be done in less than 15 minutes with no mistakes.

CT – Variables, Constants, and Division

11103 Identify and use different data types to manipulate data.
11104 Use mathematical operators, relational operators, and logical operators to solve problems.
11105 Understand and use the correct level of precedence for operators (order of operations).

Demonstrate your competence in using the math operators by creating a short code segment for **each** of the following scenarios and give example numbers and answers:

1. You have three ints called i1, i2, and i3 and you want to determine the remainders of the division of each of the numbers by 7. Give three example numbers (at least one number must be less than 7) and the answers of all 3 divisions.
2. You have three ints called i1, i2, and i3 and you want to determine the value of each divided by the other. Give three example numbers and the answers of all 6 divisions.
3. You have an int called i1 and a float called f1 and you want to determine what each divided by the other will be. Give two example numbers and answers to both divisions. Make sure that the float has a decimal value not equal to zero (i.e. 3.2 not 3.0).
4. You have an int called i1 and a float called f1 and you want to determine what each divided by the other will be. But you want to make sure that when you divide by the float, you get a float answer and when you divide by the int, you get an int answer. Give two example numbers and answers to both divisions. Make sure that the float has a decimal value not equal to zero (i.e. 3.2 not 3.0).

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Demonstrate your competence in using the math operators by creating a short code segment for**each** of the following scenarios and give example numbers and answers:

1. You have three ints called i1, i2, and i3 and you want to determine the remainders of the division of each of the numbers by 7. Give three example numbers (at least one number must be less than 7) and the answers of all 3 divisions.

```
int i1 = 9, i2 = 5, i3 = 17;
int a1 = i1 % 7; // 2
int a2 = i2 % 7; // 5
```

$7\overline{)9}\ 1$ 7 2

$7\overline{)5}\ 0$ 0 5

Demonstrate your competence in using the math operators by creating a short code segment for**each** of the following scenarios and give example numbers and answers:

2. You have three ints called i1, i2, and i3 and you want to determine the value of each divided by the other. Give three example numbers and the answers of all 6 divisions.

```
int i1 = 9, i2 = 5, i3 = 17;
int a1 = i1 / i2; // 1
int a2 = i1 / i3; // 0
int a3 = i2 / i1; // 0
int a4 = i2 / i3;
```

$$5\overline{)9}\quad 1,\ 5 \qquad 17\overline{)9}\quad 0,\ 9 \qquad 9\overline{)5}\quad 0,\ 5$$

Demonstrate your competence in using the math operators by creating a short code segment for **each** of the following scenarios and give example numbers and answers:

3. You have an int called i1 and a double called f1 and you want to determine what each divided by the other will be. You want to make sure that when you divide by the double, you get a double answer and when you divide by the int, you get an int answer. Give two example numbers and the answers to both divisions. Make sure that the double has a decimal value not equal to zero (i.e. 3.2 not 3.0).

```
int i1 = 7; double f1 = 3.2;
float fans = (double)i1 / f1; //2.1875
int   ians = (int)f1 / i1; //0
```

2.1875
3.2 ⟌ 7
64

Demonstrate your competence in using the math operators by creating a short code segment for **each** of the following scenarios and give example numbers and answers:

4. You have an int called i1 and a double called f1 and you want to determine what each divided by the other will be. You want to make sure that when you divide by the double, you get an int answer and when you divide by the int, you get a double answer (hint: use typecasting). Give two example numbers and the answers to both divisions. Make sure that the double has a decimal value not equal to zero (i.e. 3.2 not 3.0).

```
int i1 = 7; double f1 = 3.2;
int ians = i1 / (int) f1; // 2
double dans = f1 / (double) i1; // 0.457
```

$3\overline{)7}$

$7\overline{)3.2}$