

Today

 Section 3.1 is required reading and is not explicitly covered in the lecture

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- Arithmetic Operators & Expressions
 - o Sections 2.15 & 3.2
 - Computation
 - o Precedence
 - Algebra vs C++
 - o Exponents

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Assigning **floats** to **ints**

• Look at the following situation.

```
int intVariable;
```

```
intVariable = 42.7;
```

```
cout << intVariable;</pre>
```

• Q.1. What do you think is the output?

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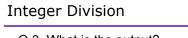
Assigning **floats** to **ints**

- Q.2. What is the output here?
 - int intVariable; double doubleVariable 78.9; intVariable = doubleVariable;
 - cout << intVariable;</pre>

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Arithmetic Operators					
 Operators allow us to manipulate data 					
 Unary: operator operand 					
• Binary: operand operator operand (left hand side) (right hand side)					
Operator	Meaning	Туре	Example		
-	Negation	Unary	- 5		
=	Assignment	Binary	rate = 0.05		
*	Multiplication	Binary	cost * rate		
1	Division	Binary	cost / 2		
%	Modulus	Binary	cost % 2		
+	Addition	Binary	cost + tax		
-	Subtraction	Binary	total - tax		
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• Q.3. What is the output?

```
o int grade;
grade = 100 / 20;
cout << grade;</pre>
```

```
o int grade;
grade = 100 / 30;
cout << grade;</pre>
```

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Division

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- grade = 100 / 40; grade is 2
 - If both operands of the division operator are integers, then integer division is performed.
 the data type of grade is not considered, why?
 - We say the integer is *truncated*. Everything after the decimal point is dropped. No rounding.

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Non-Integer Division

- grade = 100.0 / 40; cout << grade;</pre>
- Q.4. What is the output?
- Q.5. What data type should grade be declared as?

Modulus

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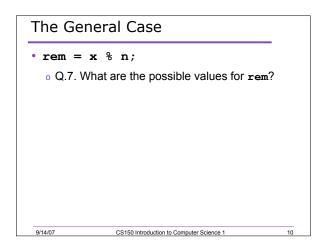
- Modulus is the remainder after integer division
- Q.6. What is the value of grade after each of these statements?

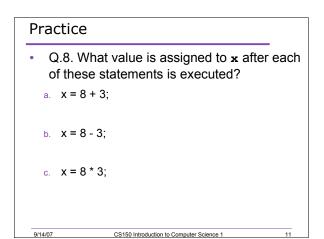
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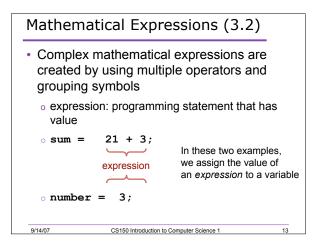
 \circ grade = 100 % 20;

 \circ grade = 100 % 30;





Practice		
d. x = 8	% 3;	
e. x = 8 /	/ 3;	
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Examples

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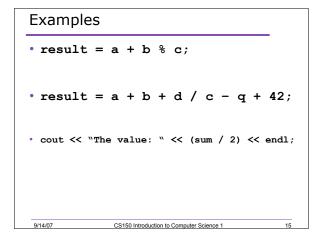
• result = x;

• result = 4 + result;

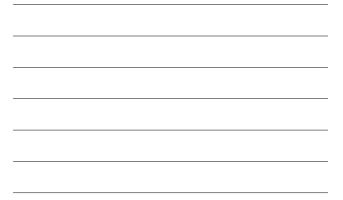
• result = 22 * number;

• result = 15 / 3;





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Operator Precedence

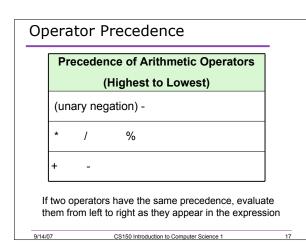
- result = a + b + d;
- result = 12 + 6 / 3;
 - o result = ?

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- Rules on how to evaluate an arithmetic expression
 - o arithmetic expressions are evaluated left to right
 - when there are two operators, do them in order of precedence

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Q.9. Practic	ce	
a. 5+2*3		_
b. 10 / 2 -1		
c. 3 + 12 * 2 -	3	
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Practice

d. 4 + 17 % 3 + 9

e. 6 - 2 * 9 / 3 * 4 - 9

Summary

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- Today we have looked at:
 Arithmetic Operators & Expressions
- Next time we will:
 - Continue looking at mathematic operators
- Completed section 2.15 & started on section 3.2

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