### Numeric Literals

A literal is a number typed directly into a program.

## Examples:

int a = 9; // 9 is a literal of type int

int b = 10.2; // Not allowed as 10.2 is not an int

double c = 3.4; // 3.4 is a literal of type double

double d = 9.0; // 9.0 is a literal of type double

double e = 9; // 9 is a literal of type int

// that gets converted to

// double and assigned to e.

The examples shown above are numeric variable declaration and assignment statements. It is important to always initialize variables with a value when they are created.

## Operators

An **operator** is a special function that combines expressions. An **operand** is one of the things that gets combined.

5 \* 4 Operator: \_\_\_\_\_\*\_\_\_\_ Operands: \_\_\_\_5, 4\_\_\_\_\_

0.7 / 4.5 Operator: \_\_\_\_/\_\_\_\_\_ Operands: \_\_\_0.7, 4.5\_\_\_\_\_\_

## Mixing ints and doubles

You can mix integer and floating point operands, but if one of them is a float or a double, the result will be a float or double as well.

## Examples:

#### Expression Result Data type

4.5 \* 2 – 5 4 integer

4.5 \* (2 – 5) -13.5 double

5 / 4 + 9.0 10.25 double

0 \* 15 / 2 0 integer

10 % 4 + 4 4.04 double

# Variables in Expressions

Anywhere you can put a literal, you can also put a variable.

## Examples:

## double d = 8.96

## int i = -2;

## double d2 = -0.5;

d + d2 \* i = \_\_\_9.6\_\_

d \* i + 3 = \_\_\_-14.92\_\_

Math.Round(d,1) \* i = \_\_\_\_\_

i \* i = \_\_\_4\_\_

double x=0.0;

x = d2 \* i + i;

What does x equal after these two statements?

x = \_\_0\_\_

x = x + 1;

## ICS: Arithmetic Expression Exercises

## What are the types and values of the following expressions?

##### Expression Result Data Type

3 \* ( ( 5 + 7 ) – 2 ) / 6 5 Integer

3 \* 5 + ( 7 – 2 ) / 6 15.88 Double

( ( 3 \* 5 ) + 7 – 2 ) / 6 3.33 Double

( ( 5 + 4 ) % 3 + 2 ) \* 3 1.35 Double

6.5 + ( 14 / 3 ) 11.16 Double

5.0 % 2 0.01 Double

Math.PI \* 2 6.28 Double

Math.Round(7.6 \* 3) 23 Integer

## What is the value of x in each case?

int a = 5;

double b = 2;

int x = 15 \* a % 2; \_\_\_\_\_\_\_\_\_\_\_

int x = 15 / b; \_\_\_\_\_\_\_\_\_\_\_

int x = (15 / b); \_\_\_\_\_\_\_\_\_\_\_

double x = a \* ( b + 0.5); \_\_\_\_\_\_\_\_\_\_

double x = b \* 2.5 / 2; \_\_\_\_\_\_\_\_\_\_