Functions

$$f: \text{Input} \longrightarrow \text{Output}$$

$$\text{Sin} : \mathbb{R} \to [-1, 1]$$

$$\text{Sin } 90^\circ = 1$$

$$\text{Print} : \text{String} \to \text{String}$$

$$\text{area\_of\_circle}(r) = \pi r^2$$

Functions

definition

Invocation/call

$$\text{area\_of\_circle}(7.0) = 3.14 \times 7 \times 7 = \cdots$$

area_of_circle(7.0)

$P(x) = x^2 + 2$

$P(1) = 1^2 + 2$

```
def a_o_c (r):
    (return 3.14 * r * r)
```

return (3.14 * 7.0 * 7.0)

result / output of the function.

$$P(x) = x^2 + x + 2$$
$$P(3)$$

Functions

definition
$$\left\{ \begin{array}{l} - \text{ name} \\ - \text{ Parameters (Placeholder)} \\ - \text{ return values (output /result)} \end{array} \right.$$

invocation/
call
$$\left\{ \begin{array}{l} - \text{ Supply arguments} \overset{\text{value}}{} \text{ to Parameters} \\ - \text{ execute body of the function.} \end{array} \right.$$

$$a\_o\_c\ (10) \quad + \quad a\_o\_r\ (5,\ 3)$$

$$3.14 * 10 * 10 \qquad\qquad 5 * 3$$

$$\underbrace{314}_{} \qquad + \qquad 15$$

$$329$$

$$5 * 3 + 10$$

$$15 + 10$$

$$= 25$$

More complicated functions

describe_roots : $(\widehat{a,b,c})$ $ax^2 + bx + c = 0$

     return $\rightarrow$

"Real and uniqu~

"imaginary

Body of a function is
normal code except for
return statements.

$r = foo(0)$

def foo(x)

~~if 0 > 0~~
~~return "positive"~~
~~elif 0 < 0~~
~~return "negative"~~

None