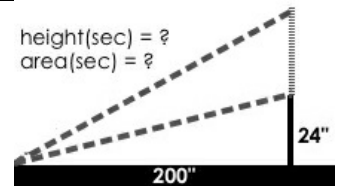


# Top Down / Bottom Up

A retractable flag pole starts out 24 inches tall, and grows taller at a rate of 0.6in/sec. An elastic is anchored 200 inches from the base and attached to the top of the pole, forming a right triangle. Using a top-down or bottom-up strategy, define functions that compute the *height* of the pole and the *area* of the triangle after a given number of seconds.



**Directions :** Define your first function ( *height* or *area* ) here.

## Contract and Purpose Statement

Every contract has three parts...

; *area* \_\_\_\_\_ : \_\_\_\_\_ *Number* -> \_\_\_\_\_ *Number*  
function name domain range

; Consumes seconds & produces the area of the triangle with a base of 200 and changing height  
what does the function do?

## Examples

Write some examples, then circle and label what changes...

(EXAMPLE (*area* \_\_\_\_\_ 5) (\* 1/2 (\* 200 (height 5)))  
function name input(s) what the function produces

(EXAMPLE (*area* \_\_\_\_\_ 6) (\* 1/2 (\* 200 (height 6)))  
function name input(s) what the function produces

## Definition

Write the definition, giving variable names to all your input values...

(define (*area* \_\_\_\_\_ *sec* )  
function name variable(s)  
(\* 1/2 (\* 200 (height *sec*)))  
what the function does with those variable(s)

**Directions :** Define your second function ( *height* or *area* ) here.

## Contract and Purpose Statement

Every contract has three parts...

; *height* \_\_\_\_\_ : \_\_\_\_\_ *Number* -> \_\_\_\_\_ *Number*  
function name domain range

; Consumes the # of seconds and produces the height, according to  $h=0.6s + 24$   
what does the function do?

## Examples

Write some examples, then circle and label what changes...

(EXAMPLE (*height* \_\_\_\_\_ 1) (+ (\* 0.6 1) 24)  
function name input(s) what the function produces

(EXAMPLE (*height* \_\_\_\_\_ 2) (+ (\* 0.6 2) 24)  
function name input(s) what the function produces

## Definition

Write the definition, giving variable names to all your input values...

(define (*height* \_\_\_\_\_ *sec* )  
function name variable(s)  
(+ (\* 0.6 *sec*) 10)  
what the function does with those variable(s)