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Note Title 1/21/2010

Heron's formula to compute the area of a triangle, as:

$$\sqrt{s \times (s-a) \times (s-b) \times (s-c)},$$

where $s = \frac{a+b+c}{2}$ (and a, b, c are the sides of the triangle).

In a high-level language (e.g. ML or Triangle), the expression

let $s = (a+b+c)/2$
in sqrt $(s*(s-a)*(s-b)*(s-c))$

evaluates to the desired area value.

To compute the same value in a hypothetical assembly language, you would have to write:

R1 contains a+b+c

```
LOAD R1 a; ADD R1 b; ADD R1 c; DIV R1 #2;
```

(adds b to R1 and sets R1 to the updated value)

```
LOAD R2 R1;
```

R3 contains (s − a)

```
LOAD R3 R1; SUB R3 a; MULT R2 R3;
```

R2 contains s × (s − a)

```
LOAD R3 R1; SUB R3 b; MULT R2 R3;
LOAD R3 R1; SUB R3 c; MULT R2 R3;
LOAD R0 R2; CALL sqrt
```