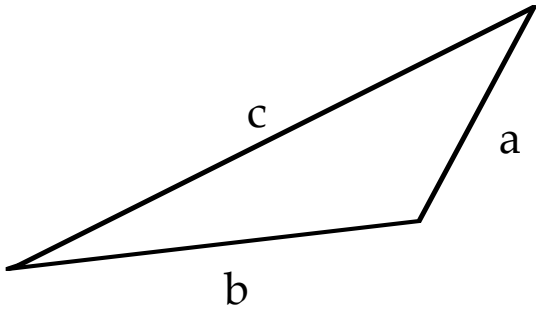
Triangular Frameworks

Joe uses metal rods to make triangular frameworks in which each side has a different length.

He buys metal rods which have lengths 1 *meter*, 2 *meter*s, 3 *meter*s etc and he always keeps one rod of each length in stock.



This diagram shows one of Joe's triangular frameworks.

a, b, c are all integers and $c > b > a$.

That is, *c* is the longest side, *a* is the shortest side and *a, b, c* are whole numbers.

1. How many different triangular frameworks can Joe make which have a longest side 7 meters long, using the rods he has in stock? Show your work.

Triangular Frameworks (continued)

2. Investigate this situation for other values of *c*.

3. Write down any generalizations you can make.