MATH 5: HOMEWORK 25
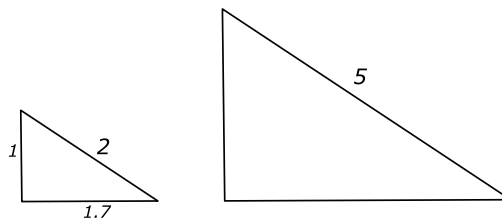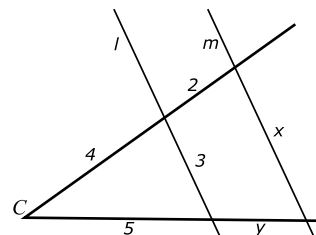## GEOMETRY 5.

1. Find the missing lengths (triangles are similar).

**2.** Find the lengths x, y in the figure (lines l, m are parallel).

3. In the story *The Musgrave Ritual*, Sherlock Holmes was following directions of an ancient manuscript that required him to measure that many steps from the tip of a shadow of an ancient elm at specific time of day. Unfortunately, by the time of the story the elm was long gone; however, Holmes was told that its height had been 64 feet. Here is how he proceeded:

"...there was no real difficulty. I went with Musgrave to his study and whittled myself this peg, to which I tied this long string with a knot at each yard. Then I took two lengths of a fishing-rod, which came to just six feet, and I went back with my client to where the elm had been. The sun was just grazing the top of the oak. I fastened the rod on end, marked out the direction of the shadow, and measured it. It was nine feet in length.

"Of course the calculation now was a simple one. If a rod of six feet threw a shadow of nine, a tree of sixty-four feet would throw one of ..."

Can you complete the sentence and find how long the shadow of the elm would be?

4. The figure shows right triangle ABC: $\angle C = 90°$, with $AC = 4$ cm, $AB = 5$ cm.
The line CD is the altitude, i.e., it is perpendicular to side AB.

    (a) Show that triangles ABC and ACD are similar.
    (b) Find lengths BC, CD.
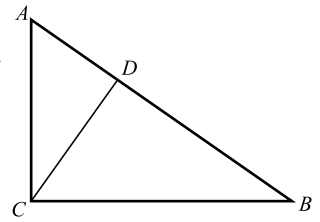
5. Given a rectangle with sides 2 cm and 4 cm, can you:
    (a) Cut it into three pieces that can be rearranged to get a right triangle?
    (b) Cut it into three pieces that can be rearranged to get a square?

6. In a rhombus, two diagonals are 16 cm and 12 cm. Find the area and perimeter of the rhombus.

7. Solve the equation $7x - 11 = 5x - 3$.