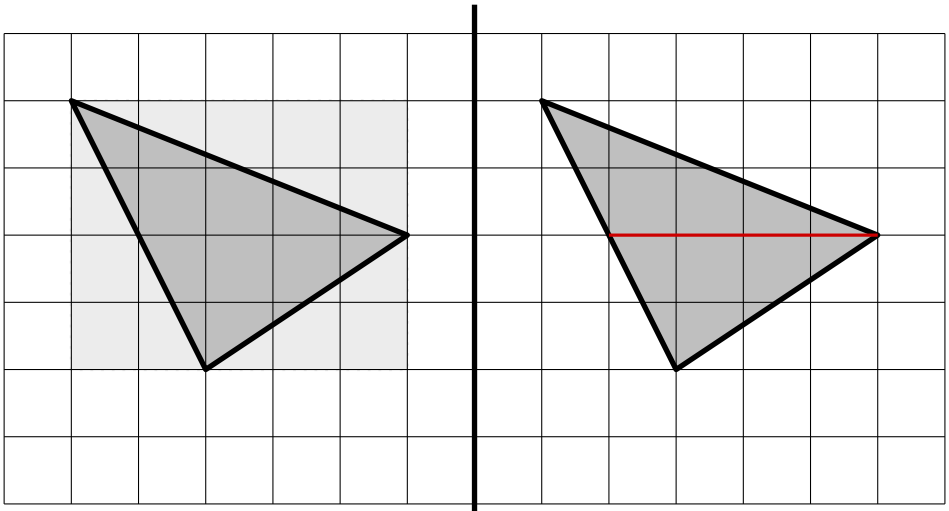
Math 202 Section 4 **QUIZ 9** SOLUTIONS **Mar 31, 2008**

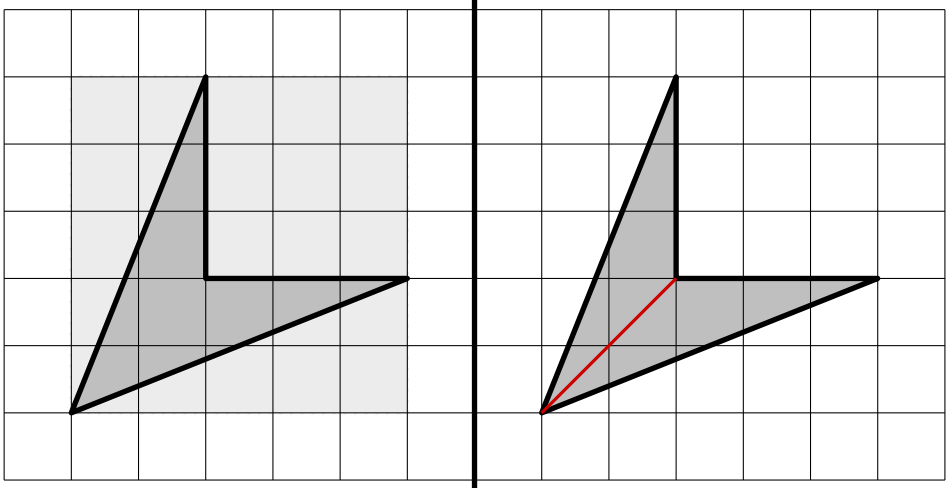
Show your work in all problems.

1. Find the area of the following in two different ways. Some possible ways: completing to a bigger shape, cutting into familiar shapes, cutting and rearranging to get a familiar shape.



area $= 4 \times 5 - (\frac{1}{2}(2 \times 4) + \frac{1}{2}(3 \times 2) + \frac{1}{2}(5 \times 2))$

area $= \frac{1}{2}(4 \times 2) + \frac{1}{2}(4 \times 2)$



area $= 5 \times 5 - (3 \times 3 + \frac{1}{2}(2 \times 5) + \frac{1}{2}(5 \times 2))$

area $= \frac{1}{2}(3 \times 2) + \frac{1}{2}(3 \times 2)$

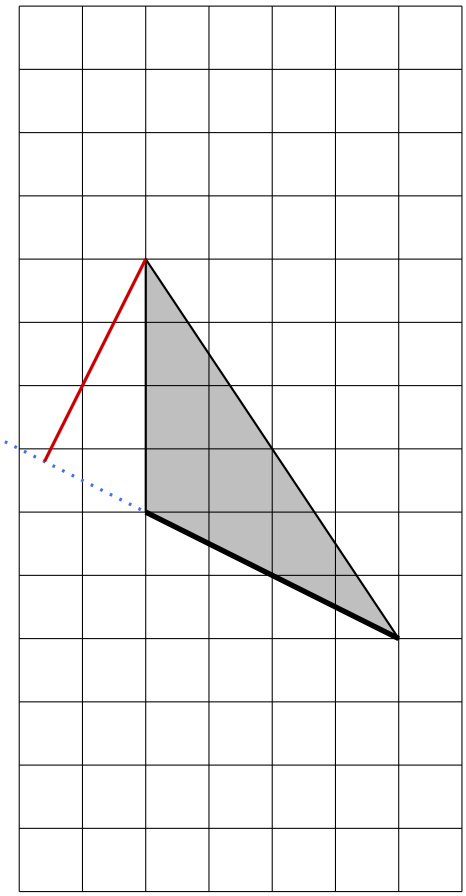
2. There are two right angled triangles P and Q. Shorter sides of P have length 3 and 9. Shorter sides of Q have length 6 and 7. Which triangle has the longest hypotenuse? Show your work.

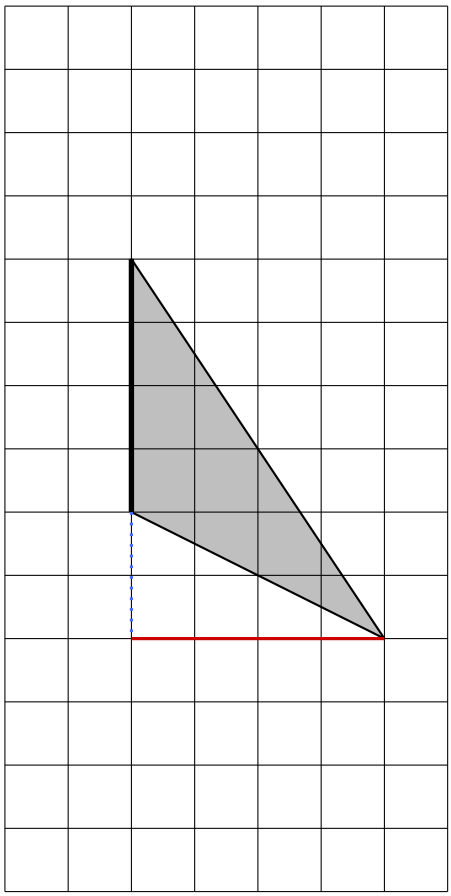
For triangle P, $c^2 = 3^2 + 9^2 = 90$
For triangle Q, $c^2 = 6^2 + 7^2 = 85$

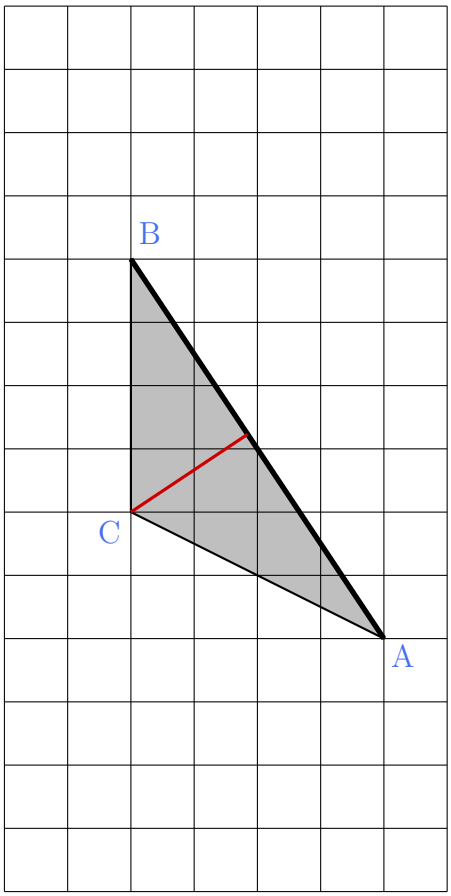
Hence triangle P has a longer hypotenuse.

(problem 3 is on the back of the sheet)

3. (a) Draw heights corresponding to each edge considered as a base for the following triangle.







3. (b) Compute the area of the triangle.

From the middle picture we see that the base is 4 units long, and also the corresponding height is 4 units long, so we have
area $= \frac{1}{2}(4 \times 4) = 8$.

3. (c) If we pick the longest side as the base, how long is the corresponding height?

Using Pythagorean theorem we find the length b of the base AB:
$6^2 + 4^2 = b^2$, hence $b = \sqrt{52}$.

We know that the area of the triangle is 8, which can also be computed as:

$$\frac{1}{2}(b \times h) = 8$$
$$\frac{1}{2}(\sqrt{52} \times h) = 8$$
$$(\sqrt{52} \times h) = 16$$
$$h = \frac{16}{\sqrt{52}}$$