**Problem of the Week**

**Problem C and Solution**

**Flip and Slide**

**Problem**

Triangle $ABC$ has vertices $A(1, 1), B(1, 4)$ and $C(2, 1)$, as shown above. We perform transformations to the triangle, as follows. First, slide $\triangle ABC$ to the right 4 units. Then, reflect the image in the $x$-axis. Then, reflect the new image in the $y$-axis. Finally, slide the newest image up 5 units. What are the coordinates of the vertices of the final triangle?

**Solution**

In the solution we are going to use notation that is commonly used in transformations. When we transform point $A$, label its transformed vertex as $A'$, we call this “$A$ prime”. When we transform point $A'$, label its transformed vertex as $A''$. We call this “$A$ double prime”. This can continue for all 4 transformations.

So, we label the four transformed triangles as $\triangle A'B'C'$ (slide to the right by 4 units), $\triangle A''B''C''$ (reflect in the $x$-axis), $\triangle A'''B'''C'''$ (reflect in the $y$-axis) and $\triangle A''''B''''C''''$ (slide up 5 units). These triangles are shown below. Each transformation is shown on the second page.

We can see that the final triangle has vertices $A''''(-5, 4)$, $B''''(-5, 1)$ and $C''''(-6, 4)$.
TRANSFORMATIONS

1) Slide to the right 4 units  

2) Reflect in the $x$-axis  

3) Reflect in the $y$-axis  

4) Slide up 5 units