PEA Problems

Recall from previous problems that we have $x$-blocks and unit blocks, as well as the $x^2$-block.

1. Shown below, the $y$-block and $xy$-block are two more members of the algebra-block family. Draw an algebra-block diagram that illustrates the equation $(1 + x)y = y + xy$.

2. The diagram shows the last member of the algebra-block family, the $y^2$-block. Show how an $xy$-block and a $y^2$-block can be combined to illustrate the equation $(x + y)y = xy + y^2$.

3. A line goes through the points $(2, 5)$ and $(6, -1)$. Let $P$ be the point on this line that is closest to the origin. Calculate the coordinates of $P$. 


4. The figure at right shows points $C$, $A$, and $R$ marked on a circle centered at $E$, so that chords $CA$ and $AR$ have the same length, and so that major arc $CR$ is a 260-degree arc. Find the angles of quadrilateral $CARE$. What is special about the sizes of angles $CAR$ and $ACE$?

5. Let $F = (2, 3)$. Find coordinates for three points that are equidistant from $F$ and the y-axis. Write an equation that says $P = (x, y)$ is equidistant from $F$ and the y-axis.