Unit-Circle Lore

Here is a picture of the famous unit circle showing the variable first-quadrant angle $\theta$:

1. Answer the following in terms of this variable $\theta$.

   (a) The coordinates of point $P$

   (b) The coordinates of point $Q$

   (c) Area of $\triangle COP$

   (d) Area of $\triangle POA$

   (e) Area of $\triangle AOQ$

   (f) The slope of the line through $O$ and $P$

   (g) An equation for the line through $O$ and $Q$

   (h) The slope of the line through $C$ and $P$

   (i) The slope of the line through $B$ and $P$

   (j) $\angle CPA$

   (k) $\angle BOQ$

   (l) $\angle PCA$

   (m) Length of the line segment between $C$ and $P$

   (n) Length of the line segment between $B$ and $P$

   (o) Length of the line segment between $O$ and $Q$

   (p) An equation for the line through $P$ and perpendicular to the line through $O$ and $P$