Quiz 6

• To find the distance \( d \) between two points \( P \) and \( Q \) on opposite shores of a lake, a surveyor locates a point \( R \) that is 100 meters from \( P \) such that \( RP \) is perpendicular to \( PQ \), as shown in the figure. Next, using a transit, the surveyor measures angle \( \text{PRQ} \) as 60 degrees. Find \( d \).

\[
\frac{d}{100} = \tan 60^\circ = \sqrt{3}
\]

\[
d = \sqrt{3} \times 100 \approx 173
\]

• Find the exact values of the six trigonometric functions for the acute angle \( \beta \) if \( \csc \beta = 7 \).

\[
\frac{1}{\sin \beta} = \csc \beta = 7 = \frac{r}{y}
\]

\( r = 7, \ y = 1 \)

\[
\cos \beta = \frac{x}{r} = \frac{4\sqrt{3}}{7}
\]

\[
\tan \beta = \frac{y}{x} = \frac{1}{4\sqrt{3}}
\]

\[
\cot \beta = \frac{x}{y} = 4\sqrt{3}
\]