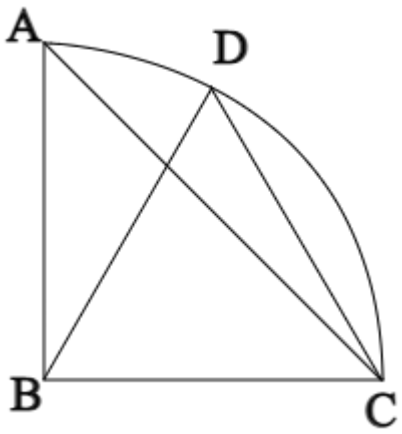
Answer all the questions.

Question. A



In the figure, a quarter circle ABC is shown. BD is a straight line such that $\angle ABD = 30^\circ$
AC and DC are also straight lines.
Denote the intersection point of BD and AC by P.
If the ratio of

$$\frac{\triangle ABP}{\triangle DCP}$$

can be expressed as

$$\frac{A}{B - \sqrt{C}}$$

Find A, B, C

Question. B

A circle

$$C : (x - \alpha r)^2 + (y - \beta r)^2 = r^2$$

has two tangents, $x = y$ and $x = 0$ and known to have radius r.
Find α, β

END