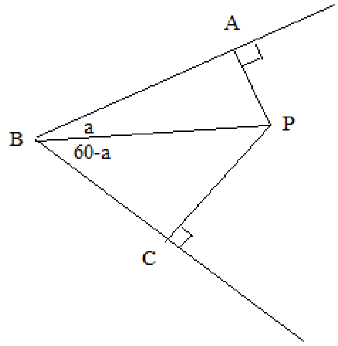

PA=2 cm

PC=11 cm

angle ABC=60˚

BP -?

Denote angle ABP as a. Then angle PBC = ABC-ABP=60˚-a.

Triangle ABP:

sin a = AP/BP (from definition), therefore BP=AP/sin(60˚-a) (1)

Triangle PBC:

sin (60˚-a)=PC/BP (from definition), therefore BP=PC/sin(60˚-a) (2)

From (1) and (2):

AP/sin a = PC/sin(60˚-a) therefore PC/AP=sin(60˚-a)/sin a (3)

From formula of angle difference for sine (sin a-b=sin a *cos b – sin b * cos a)

sin(60˚-a)=sin60˚*cos a - cos60˚*sin a=$\frac{\sqrt{3}}{2}$cos a – ½ sin a (4)

Substitute (4) into (3)

PC/AP=$\frac{\sqrt{3}}{2}$(cos a/sin a) – ½ (sin a/sin a)= $\frac{\sqrt{3}}{2}$ctg a – ½=11/2 using elementary math ctg a= $\frac{10}{\sqrt{3}}$

Triangle ABP:

ctg a= AB/AP

AB=AP*ctg a, using Pythagorean theorem

BP=$\sqrt{AB^2 + AP^2} = \sqrt{\frac{404}{3}}$

Answer: BP=$\sqrt{\frac{404}{3}}$