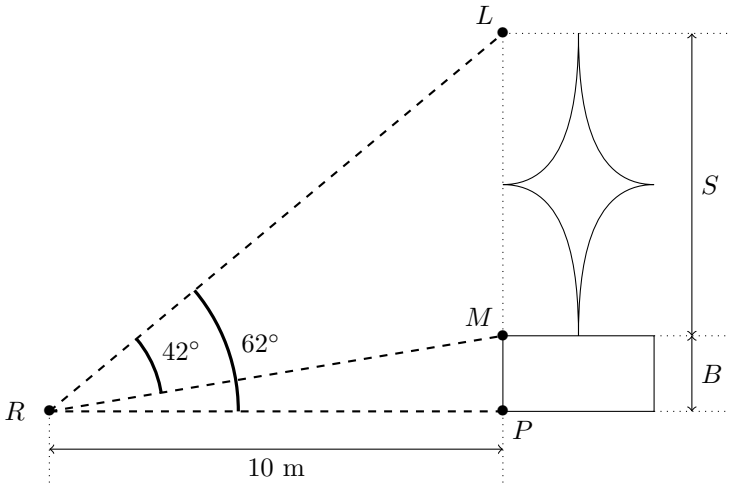
6. [6 points] A sculpture of a star of height S (measured in meters) is mounted on a base of height B (measured in meters). Reina is standing at a distance of 10 meters away from the base of the statue, at the point R.



The measures of the angles LRM and LRP are 42° and 62° respectively. Note that **the diagram above is *not* drawn to scale**. For this problem, you should **show your work**, and write your answers *in the spaces provided*.

a. [3 points] Write an expression for the height S of the star. Your answer may involve the constant B.

Solution: Since LPR is a right angle, we have:

$$\tan(62°) = \frac{S+B}{10}$$

and solving for S gives us:

$$S = 10\tan(62°) - B$$

$S =$ $10\tan(62°) - B$

b. [3 points] Find the height B of the base of the statue. Your answer for this part **cannot** involve S.

Solution: Since MPR is a right angle and the measure of angle MRP is $62° - 42° = 20°$, we have:

$$\tan(20°) = \frac{B}{10}$$

and solving for B gives us:

$$B = 10\tan(20°)$$

$B =$ $10\tan(20°)$