A goat is attached with a rope to a stake in the ground. The goat keeps approximately 2123.715 square feet of grass nice and short. A square fence surrounds the goat’s circular eating area such that at times the goat eats the grass at the fence line at exactly four spots. Johnny is in a hot air balloon above the goat. Like any little boy, Johnny wants to drop something from the hot air balloon, however, he knows if he drops his baseball, he will only be able to find it if it lands where the goat has mowed. What is the probability Johnny will find his ball? (Things to think about: 1) We are assuming Johnny will get the ball inside the fence. 2) We are not making assumptions about the hot air balloon placement. The ball has an equally likely chance to land anywhere within the fenced in area.)

A farmer has 295.31 feet of fence, which he has used to make a circular pen. A goat is tethered to the pen such that he can eat along the fence, all the way around the fence. (Think about it as a track along the fence.) How long must the goat’s rope be so he can eat half of the area of grass inside the circular pen?

What if the goat is now tethered with a 100 foot rope to the corner of a building? What is the area of the grass the goat can reach?

(Source: available upon request)

