LESSON 6.3

NAME _____ DATE _____

Math and History Application

For use with page 346

HISTORY Some of the earliest recorded mathematics that exists today dates back to ancient Egypt (3000 B.C. to A.D. 260). Egyptian mathematics was written on *papyrus*, a paper-like substance made from the papyrus plant, which grows along the Nile River. Because of Egypt's dry climate, the writings are well preserved.

Most of what we know about Egyptian mathematics comes from Napoleon's unsuccessful 1798 invasion of Egypt. In addition to 38,000 soldiers, Napoleon also brought several scholars with him to research various aspects of Egyptian society. The result was the discovery of an advanced civilization that existed long before the ancient Greek and Roman empires.

Ancient Egyptian mathematics was motivated by necessity. Each spring, the Nile River would overflow, forcing farmers to reset the boundaries between their properties. In an area where usable soil was scarce, this was no small matter. It was for this reason that Egyptian scholars developed ways for calculating the area of two-dimensional regions.

MATH One Egyptian papyrus gives instructions for finding the area of a circle. Consider a circle inscribed in a 3-by-3 grid (see figure at the left below). In the figure at the right below, an octagon is drawn.

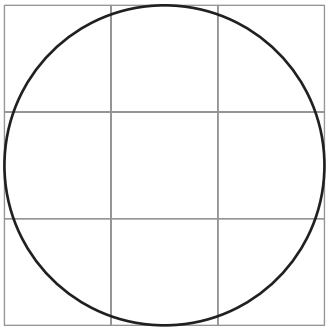

Figure 1

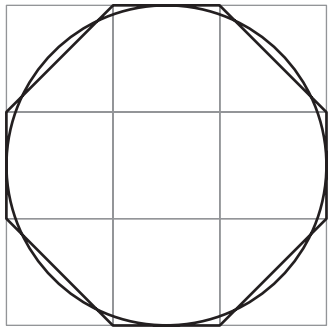

Figure 2

1. Explain how you can use the second figure to approximate the area of the circle. Use your method to approximate the circle's area.
2. Using the modern formula for the area of a circle $A = \pi r^2$, show that the Egyptian method gives the approximation $\pi \approx 3.111 \ldots$.