

Puzzle of the Week

Egyptian Fractions – 1

Around 4000 years ago, the ancient Egyptians developed a special way of writing fractions. **Unit Fractions**, which are fractions with 1 in the numerator such as $\frac{1}{3}$ and $\frac{1}{8}$, were important to them, and are also known as **Egyptian Fractions**. The Egyptians wrote *any* fractional quantity as an **Egyptian Fraction Sum**, which is a sum of Egyptian Fractions with no duplicates. For example, for $\frac{7}{8}$ they wrote the Egyptian Fraction Sum $\frac{7}{8} = \frac{1}{2} + \frac{1}{4} + \frac{1}{8}$.

THE CHALLENGE: Write 1 as an Egyptian Fraction Sum using as few fractions as possible.

$$1 = 1/A + 1/B + \dots$$

EXPLORATION: Convince yourself that you can't use fewer fractions to get 1. Write $\frac{2}{3}$, $\frac{3}{2}$, $\frac{2}{7}$, $\frac{3}{7}$, and $\frac{4}{7}$ as an Egyptian Fraction Sum. Play with other numbers and look for patterns for ways to break a fraction into Egyptian Fractions that will help you work with them.