Problem 1. A man can saw a long cylindrical log into 5 cylindrical pieces in 5 minutes. Working at exactly the same pace, into how many such pieces can he saw it in 10 minutes?
Problem 2. Six circles of radius 1 are packed tightly between a circle of radius 1 and an outer circle, as pictured. What portion of the area of the outer ring is covered by the six circles?
Problem 3. Solve for $x$:

$$2 \log_3 x - \log_3 (2x + 7) = 2.$$
Problem 4. A drawer contains 6 red socks and 4 black socks. Two socks are selected randomly (without replacement). What is the probability that the socks are the same color?
Problem 5. $BC$ is the hypotenuse of right triangle $\triangle ABC$. $D$ is the midpoint of $AB$ and $E$ is the midpoint of $AC$. If $CD = 7$ and $BE = 4$, then what is $BC$?
Problem 6. The polynomial \( f(x) = (-4x + 3)^7 \) is written out as a sum of multiples of powers of \( x \). Find the sum of the coefficients.
Problem 7. A ball of radius 3 is put at the bottom of a cylindrical can of radius 4, touching the side of the can. We then put a ball of radius 2 on top of it, so that it is tangent to the opposite side. How high above the bottom of the can will the top of the second ball be?
Problem 8. How many 3-digit numbers with one each of the digits 5, 7, and 9 are divisible by 11?
Problem 9. Three point masses with masses 1, 2, and 2 are placed, equally spaced, on the unit circle. How far from the center of the circle is the center of mass?
Problem 10. Find the smallest value of \( f(x) = |x + 1| + |x| + |x - 1| + 2|x - 3| \).