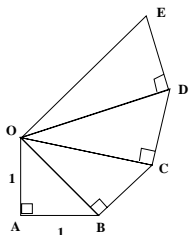


BC Exam

1. Two men working 2 hours per day for 2 days produce 2 barrels. How many barrels can 6 men produce if they work 6 hours per day for 6 days?

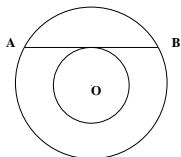
2. A library contains 10,000 volumes. The books of fiction are 9 times as many as the scientific works, the books of travel and books of biography are each one-third as many as the books of fiction, and all the other works are 4 times as many as the scientific works. How many books of fiction are there in the library?

3. Find the distance OE in the figure below given $AB = BC = CD = DE$:

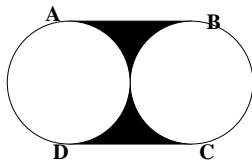


4. A string 2 feet long is divided into two parts such that the ratio of the larger piece to the whole is the same as the ratio of the smaller piece to the larger. What is the length of the larger piece?

5. In the figure below, both circles are centered at point O and \overline{AB} is tangent to the small circle. If $AB = 20$, what is the area between the two circles?



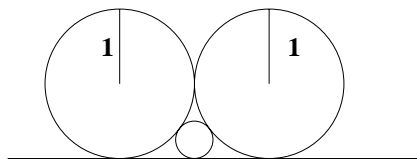
6. Find the area of the shaded region if the radius of each circle is one unit and \overline{AB} and \overline{CD} are tangent to each circle and \overline{AD} and \overline{BC} are diameters of the circles.



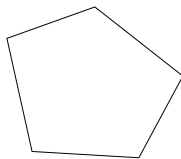
7. What is the last digit of 3^{1118} ?

8. Given that $\frac{p}{q}$ and $\frac{r}{s}$ are the rational roots of the quadratic equation $ax^2 + bx + c = 0$, find the roots of the equation $cx^2 + bx + a = 0$.

9. Given 2 circles of radius 1 with a common tangent line and a common point, find the radius of the smaller circle.



10. Find the sum (in degrees) of all the interior angles of the pentagon in the diagram below.



11. The graphs $y = x + 2$ and $y = ax^2$ intersect at a point A whose x -coordinate is 3. Find the value of a .

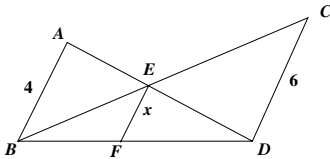
12. Solve the system

$$\begin{aligned}\frac{2}{y} - \frac{2}{z} &= 5 \\ -\frac{4}{y} + \frac{2}{z} &= -1\end{aligned}$$

13. A side of an equilateral triangle is 20 inches long. A second equilateral triangle is inscribed in it by joining midpoints of the sides of the first triangle. The process is continued. Find the perimeter of the 5th inscribed equilateral triangle.

14. Quadrilateral $WXYZ$ is located in the xy plane with the points located at the following coordinates: $W(3, 8)$, $X(8, 9)$, $Y(7, 4)$, $Z(2, 3)$. Show that the diagonals are perpendicular.

15. In the figure below, $\overline{AB} \parallel \overline{EF} \parallel \overline{CD}$, and $AB = 4$, $CD = 6$. Find EF .



16. Given 10 noncollinear points in a plane, how many different lines can be drawn if each line passes through exactly 2 points?

17. An instructor gives two versions of an exam, A and B. There are 85 students in the class. The average on version A is 68; the average on version B is 73. If the overall average is 70, how many students took version A?