Hints  

1. Use $30 - 60 - 90^\circ$ property. That is, if $\triangle ABC$ is such that $\angle BAC = 60^\circ$ and $\angle BCA = 30^\circ$, then if $AC = a$, $BC = a\sqrt{3}$ and $AB = 2a$.

2. If $\triangle ABC$ has angles $\alpha, \beta,$ and $\gamma$, then $\alpha + \beta + \gamma = 180^\circ$.

3. An altitude of a triangle is a line segment from a vertex of the triangle to the line containing the opposite side and that is perpendicular to that line. A triangle is a right triangle if and only if the square of one side of a triangle is equal to the sum of the squares of the other two sides. Similar triangles have proportional sides.

4. Draw the altitude and call the height $h$ and apply the Pythagorean Theorem (to two triangles).

5. Use $30 - 60 - 90^\circ$ property and similar triangles.

6. Let $x = MC$ and $y = CN$ and apply the Pythagorean Theorem (to three triangles).

7. Arc length of a sector is $\frac{\theta}{360^\circ} \cdot 2\pi r$ where $\theta$ is in degrees.

8. Make the triangle $\triangle CFD$. What can you say about $\angle CFD$? Use similar triangles.

9. Find the area of the semicircle, sector, and an equilateral triangle.

10. The shaded region consists of a semicircle of diameter $a + b$ with the addition of a semicircle of diameter $a$ and the deletion of a semicircle of diameter $b$. Use symmetry to find the area of the unshaded region.