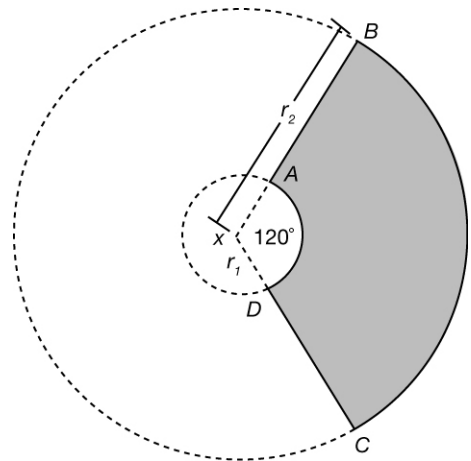


Let's Have a Parade

There are many reasons and occasions for parades. Sometimes the circus is in town. Other times, there is a holiday. Some parades are for political or health issues.

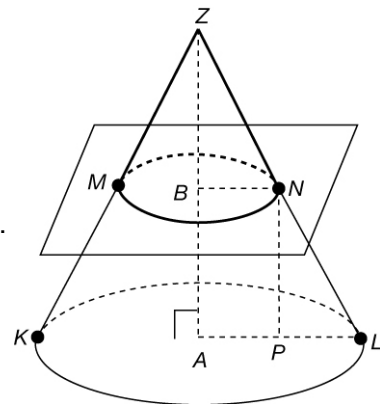
- The circus is in town. The ringmaster has a megaphone to call out to the people lining the parade route. The megaphone (shown here, cut open in a two-dimensional diagram) is the shaded region.



- Write an expression for the area of the shaded region. Use what you know about concentric circles and areas of a fraction of a circle. Show your work.

- The shaded region is cut out and shaped into a megaphone. The smaller radius of the shaded region, r_1 , is 8 inches. The larger radius of the shaded region, r_2 , is 15 inches. To the nearest tenth of a square inch, find the area of the outside of the megaphone. Show your work.

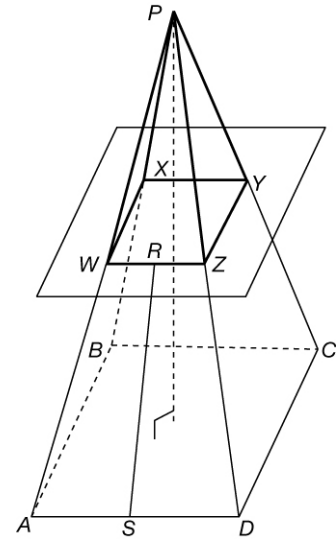
- This diagram shows a stand that the mayor and other dignitaries use to review the parade. The three-dimensional figure is a frustum of a right circular cone. (The cone with circular base with center B and vertex Z is cut from the cone to make the frustum.)



- In the diagram, $BN = 15$, $AL = 30$, and $NL = 35$. Find AB . Show your work.

- In simplest radical form, find the area of the frustum. Show your work.

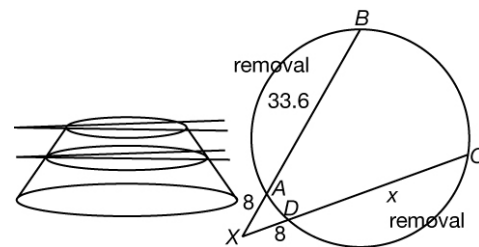
3. This diagram shows part of a parade float. It is a large right square pyramid with a smaller right square pyramid with base quadrilateral $WXYZ$ and vertex P removed. The result is the frustum of a pyramid. The lengths of the sides of square $WXYZ$ are 50% of the lengths of the sides of square $ABCD$.



- a. If $AB = 40$ inches and the length of \overline{RS} joining the midpoints of \overline{AD} and \overline{WZ} is 30 inches, find the area of trapezoid $AWZD$. Show your work.

- b. Find the total area of the frustum. Show your work.

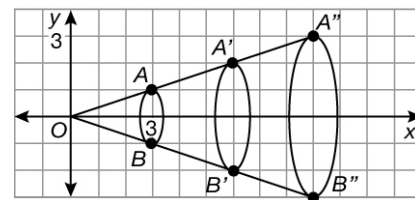
4. This diagram shows part of another parade float. It is a frustum of a cone with line segments showing a section that is to be removed. The circular diagram shows a view of the top of the frustum looking directly down.



- a. Find x . Show your work.

- b. Given the answer in part a, what can be said about $m\widehat{AB}$ and $m\widehat{CD}$. Show your work.

5. This diagram shows a rough plan for an ornament on a parade float.



- a. What dilation maps A to A'' and B to B'' ?

- b. Use a matrix to show that the reflection of A'' in the x -axis is B'' .
