



Unit 25 SURFACE MEASUREMENT—CIRCLES

BASIC PRINCIPLES OF SURFACE MEASUREMENT

The area of circular figures is found using the formula $A = \pi r^2$ (r is the length of the radius of the circle and π is a constant value approximately $\frac{22}{7}$ or 3.1416). If remembering this formula is difficult, think of it as πr (pi railroad). If the diameter of the circle is given instead of the radius, remember that the radius is always one-half the diameter ($\frac{1}{2}d = r$).

Example: How many square feet of surface area are there in a circular figure with a radius of 8 feet 6 inches? (8 feet 6 inches is 8.5 feet.)

$$\text{Area} = \pi r^2$$

$$\text{Area} = 3.1416 \times 8.5 \text{ ft} \times 8.5 \text{ ft} = 226.98 \text{ sq ft}$$

PRACTICAL PROBLEMS

Using $\pi = 3.1416$, find the area of the following circles:

Express answers for problems 1 and 2 correct to the nearest square inch.

1. Diameter = 3' 0" _____

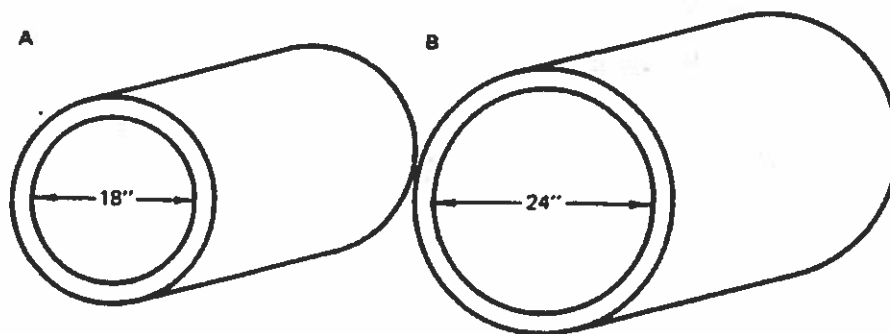
2. Radius = 6' 0" _____

Express answers for problems 3 and 4 correct to the third decimal place.

3. Diameter = 8 m _____

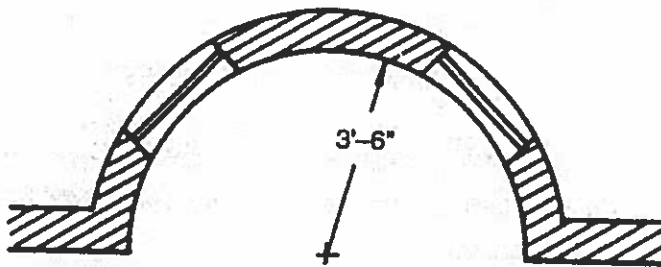
4. Radius = 7 mm _____

5. Cross sections of pipes A and B are shown. What is the difference to the nearest square inch between their inside areas?

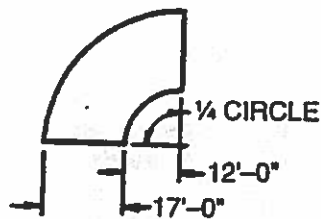


Note: Express the answers correct to the nearest thousandth.

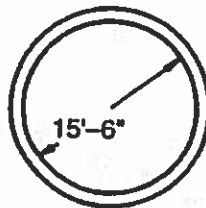
6. Determine the floor area in the semicircular bay window shown.



7. How many square feet of ground area are occupied by the curved runway shown?

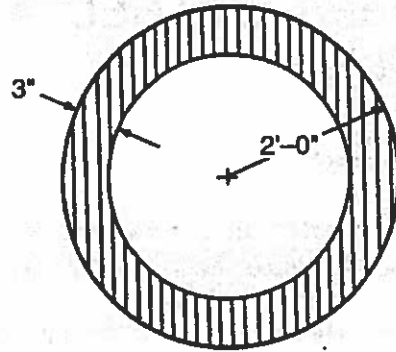


8. How many square yards of ceiling surface are there in a bay window ceiling if the bay is one-quarter of a circle in plan and has a radius of 7 feet 6 inches?
9. How many square feet of concrete surface are there in the round floor shown?

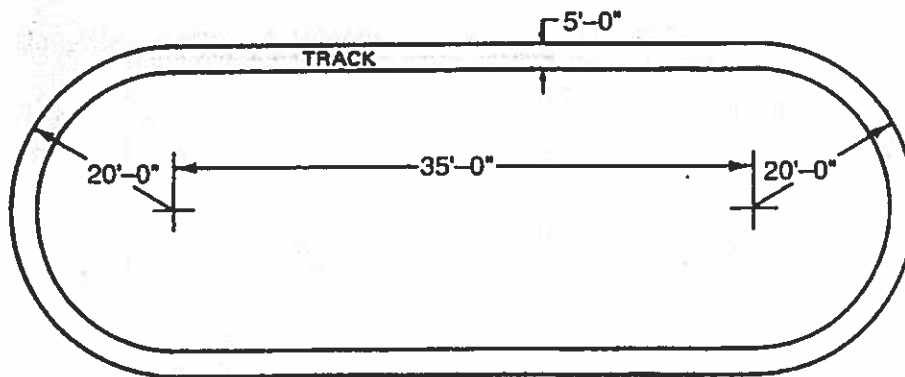


10. A circular plywood tabletop with a diameter of 36 inches is covered with laminated plastic. The cover piece is cut from a sheet 36 inches square. How many square inches of material are wasted?

11. A stencil is used to aid in spray painting a playground. What is the area of the surface to be painted (shaded area)?



12. A rough floor is laid under the space occupied by the gymnasium track shown. Determine the area occupied by the track. Do not include the space inside the track.



13. Find the cross-sectional area of the wooden block illustrated.

