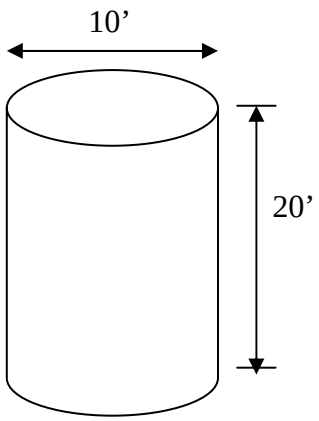
SOML MEET 2 **NAME: _____**
EVENT III **TEAM: _____**
AREA **SCHOOL: _____**

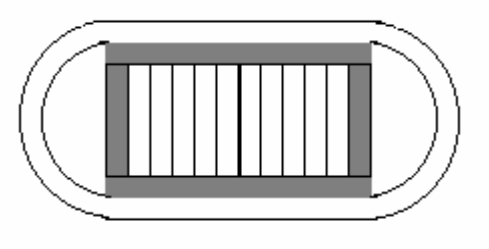
1.



[2 Points] Find the total surface area of an oil tank shaped like a right circular cylinder that is 10′ in diameter and 20′ tall (see diagram below). Give an exact answer, not a decimal approximation

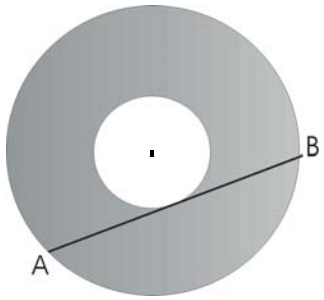
ANS:

2. [3 Points] A standard football field, including endzones and sidelines, is 120 yards long and 70 yards wide. An oval track (semicircular ends) that is 10 yards wide encircles the field as shown below. If synthetic track carpet sells for $25.00 per square yard, how much will it cost to buy synthetic track carpet for this track? Round your answer to the nearest dollar.



ANS:

3. [5 Points]

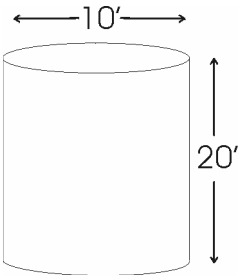


If $m\overline{AB} = 10$ inches, find the shaded area. Assume that the circles are concentric, $\overline{AB}$ is tangent to the smaller circle, and $\overline{AB}$ is a chord of the larger circle. Give an exact answer, not a decimal approximation.

ANS:_____

SOML MEET 2 **NAME: KEY**
EVENT III **TEAM:**
AREA **SCHOOL:**

1. [2 Points] Find the total surface area of an oil tank shaped like a right circular cylinder that is 10′ in diameter and 20′ tall (see diagram below). Give an exact answer, not a decimal approximation.



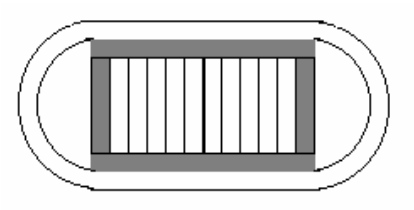
Solution:

Area of top $= \pi r^2 = \pi 5^2 = 25\pi$ ft^2
Area of bottom $= 25\pi$ ft^2
Lateral area $= C(20) = (10\pi)(20) = 200\pi$ ft^2

$C = 2\pi r = 10\pi$

ANS: Total Area $= 250\pi$ ft^2

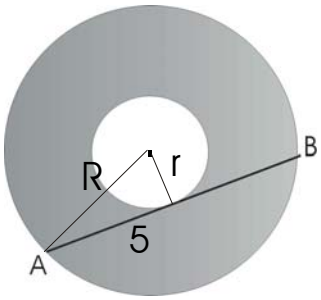
2. [3 Points] A standard football field, including endzones and sidelines, is 120 yards long and 70 yards wide. An oval track (semicircular ends) that is 10 yards wide encircles the field as shown below. If a synthetic track carpet sells for $25.00 per square yard, how much will it cost to buy synthetic track carpet for this track?
Round your answer to the nearest dollar.



Solution:
Area for straight-a-way: 120(10)=1200 sq. yd.
x 2
2400 sq. yd.
Area for the semicircles together: $\pi R^2 - \pi r^2 = \pi(45)^2 - \pi(35)^2$
$\cong 2513.274123$ sq. yd.
Total area: 4913.274123 sq. yd.
Total cost: (4913.274123)(25)=$122,831.85 or 122,832.

ANS: $122,832

3. [5 Points] If $m\overline{AB} = 10$ inches, find the shaded area. Assume that the circles are concentric, $\overline{AB}$ is tangent to the smaller circle, and $\overline{AB}$ is a chord of the larger circle. Give an exact answer, not a decimal approximation.



Solution:
$R^2 = r^2 + 5^2$, so $R^2 - r^2 = 25$
but $A = \pi R^2 - \pi r^2$
$= \pi(R^2 - r^2)$
$= \pi(25)$

ANS: 25π in^2