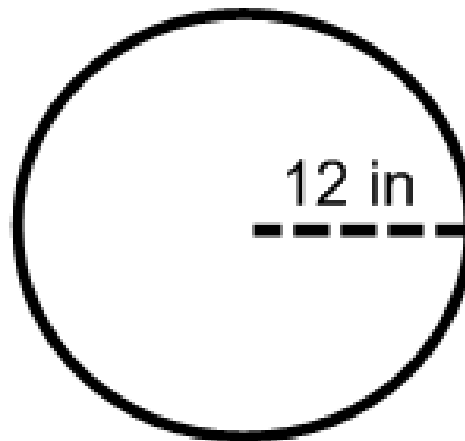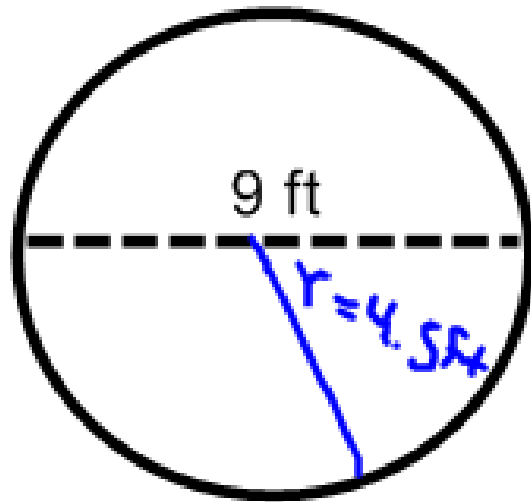Get out your homework and have it ready to check. Warm Up by finding the area and circumference of the circles below.

$C = 2\pi r$ or $C = \pi d$ $A = \pi r^2$
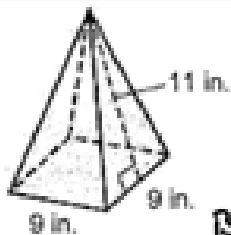
Classwork - Surface Area of Cylinders

9 ft
$r = 4.5 ft$

12 in

$C = 3.14(9) = 28.26 ft$

$A = 3.14(4.5^2) = 63.59 ft^2$

$C = 2(3.14)(12) = 75.36 in$

$A = 3.14(12^2) = 452.16 in^2$

1.

11 in.

9 in. 9 in. 9 in.

$B = 9(9) = 81 \text{ in}^2$
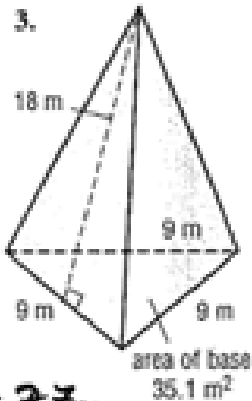
$P = 36 \text{ in}$

$L.A. = \frac{1}{2}(36)(11) = 198 \text{ in}^2$

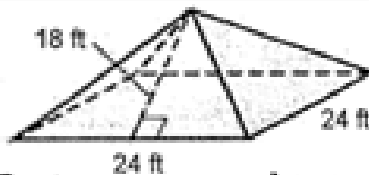$LA = \underline{198 \text{ in}^2}$

$SA = \underline{279 \text{ in}^2}$ $SA = 198 + 81$

2.

18 ft

24 ft

24 ft
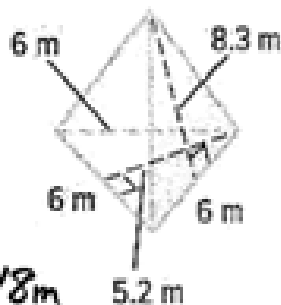
$P = 96 \text{ ft}$ $L.A. = \frac{1}{2}(96)(18) = 864 \text{ ft}^2$

$B = 24(24) = 576 \text{ ft}^2$

$SA = 864 + 576$

$LA = \underline{864 \text{ ft}^2}$

$SA = \underline{1440 \text{ ft}^2}$

3.

18 m

9 m

9 m 9 m

area of base 35.1 m²

$P = 27 \text{ m}$

$L.A. = \frac{1}{2}(27)(18) = 243 \text{ m}^2$

$LA = \underline{243 \text{ m}^2}$

$SA = \underline{278 \text{ m}^2}$ $SA = 243 + 35.1$

4.

6 m 8.3 m

6 m 6 m

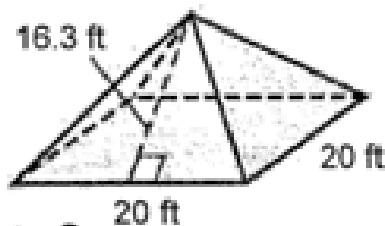$P = 18 \text{ m}$ 5.2 m

$L.A. = \frac{1}{2}(18)(8.3) = 74.7 \text{ m}^2$

$B = \frac{1}{2}(6)(5.2) = 15.6 \text{ m}^2$

$SA = 74.7 + 15.6$

$LA = \underline{74.7 \text{ m}^2}$
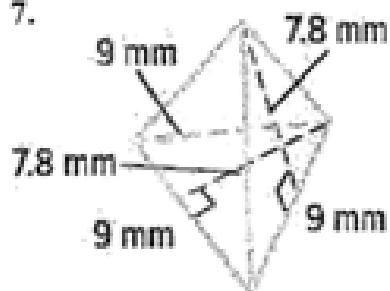
$SA = \underline{90.3 \text{ m}^2}$

5.

16.3 ft
20 ft
20 ft
7

$P = 80 ft$

$L.A. = \frac{1}{2}(80)(16.3) = 652 ft^2$

$B = 20(20) = 400 ft^2$

$LA = \underline{652 ft^2}$ $S.A = 652 + 400$

$SA = \underline{1052 ft^2}$

6.

16 in.
13 in.
13 in.
13 in.

$P = 52 in$

$L.A. = \frac{1}{2}(52)(16) = 416 in^2$

$B = 13(13) = 169 in^2$

$S.A. = 416 + 169$

$LA = \underline{416 in^2}$

$SA = \underline{585 in^2}$

7.

9 mm   7.8 mm
7.8 mm
9 mm   9 mm

$P = 27 mm$

$L.A. = \frac{1}{2}(27)(7.8) = 105.3 mm^2$
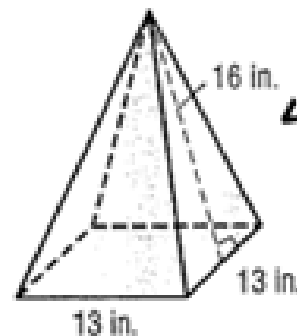
$B = \frac{1}{2}(9)(7.8) = 35.1 mm^2$

$S.A. = 105.3 + 35.1$

$LA = \underline{105.3 mm^2}$

$SA = \underline{140.1 mm^2}$

8.

2 m   4 m
2 m   2 m
1.7 m
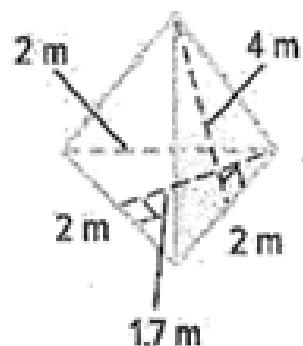
$P = 6 m$

$L.A. = \frac{1}{2}(6)(4) = 12 m^2$

$B = \frac{1}{2}(2)(1.7) = 1.7 m^2$

$S.A. = 12 + 1.7$

$LA = \underline{12 m^2}$

$SA = \underline{13.7 m^2}$

**9. MODEL HOUSE** Baron built a square pyramid block to use as the roof of a model house he was making. The square base had sides of length 8 inches and the slant height was 6 inches. Find the surface area of the block. Round to the nearest tenth.

$$P = 8(4) = 32 \text{ in}$$

$$L.A. = \tfrac{1}{2}(32)(6) = 96 \text{ in}^2$$

$$B = 8(8) = 64 \text{ in}^2$$

$$S.A. = 96 + 64 = \boxed{160 \text{ in}^2}$$

Finding the surface area of a cylinder is just like finding the area of a prism. Like prisms, you must make sure you know what your 3D cylinder looks like as a net. The picture below shows a cylinder as a net and the dimensions you need to determine the surface area of a cylinder.

$C = 2\pi r$ h   ➡   h C ➡ $C = 2\pi r$ h

The circumference of the circle base is also the length of the rectangle.

Circumference of a Circle	**Area of a Circle**	**The height of the cylinder is the width of the rectangle.**
$C = \pi d$ OR $C = 2\pi r$	$A = \pi r^2$ OR $A = \pi \cdot r \cdot r$	
Can use radius or diameter	Can ONLY use radius	

Use the 3.14 for π.
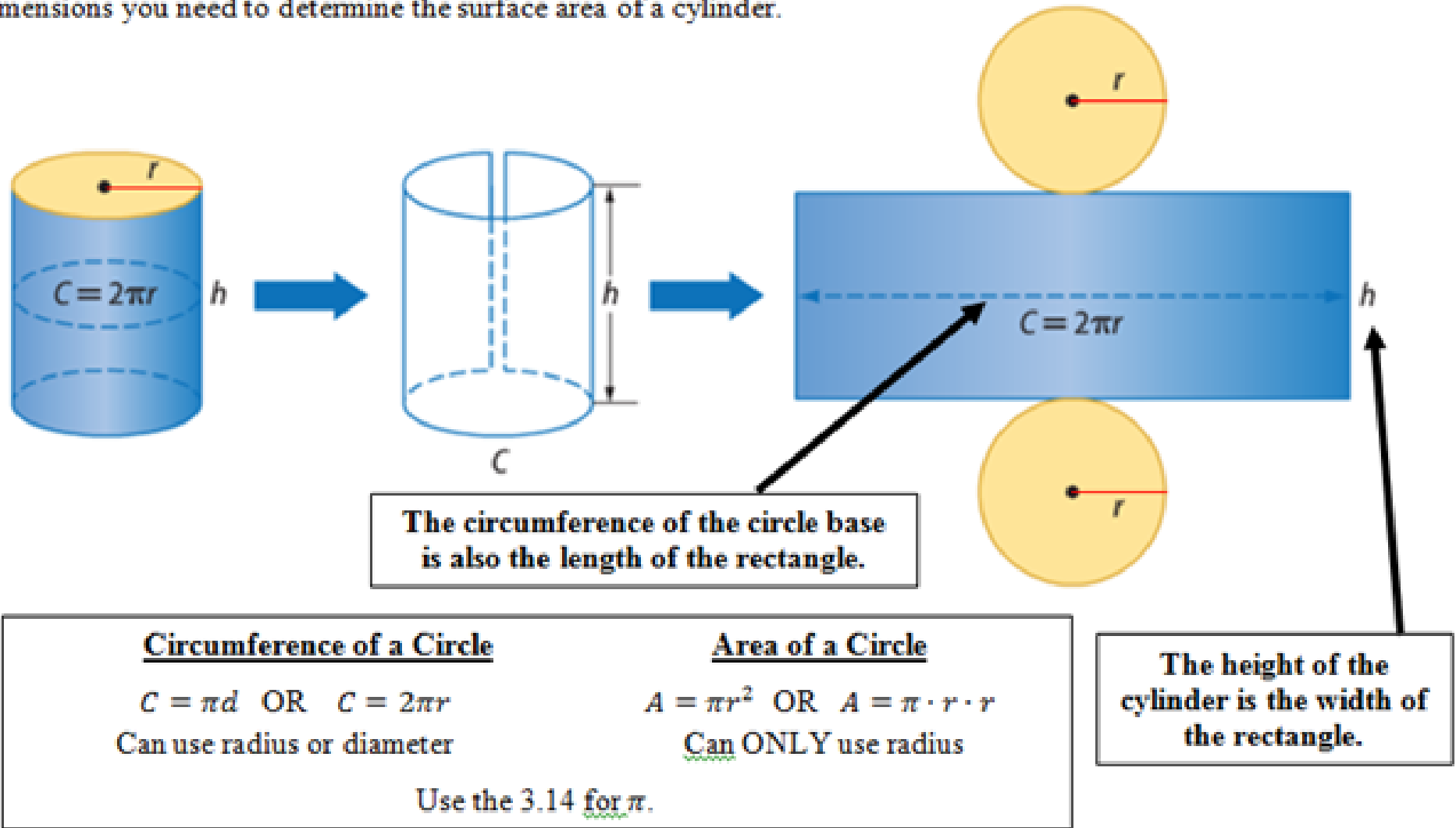
Place the dimensions from the 3D cylinder on the cylinder net on the right. Use the steps on the far right to help find the total surface area of the 3D cylinder. SHOW WORK

4 cm

10 cm

4 cm

$C = 25.12cm$

4 cm
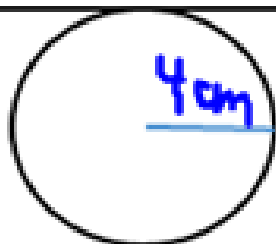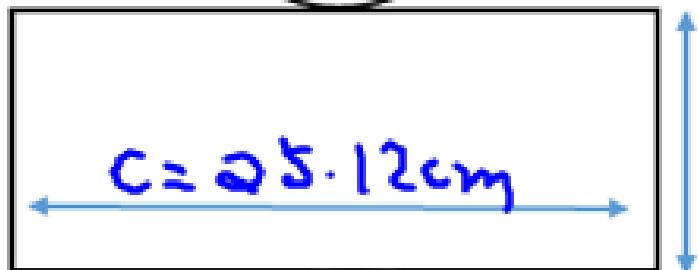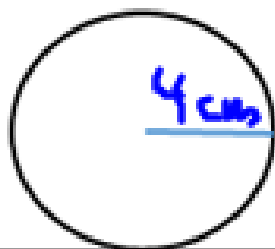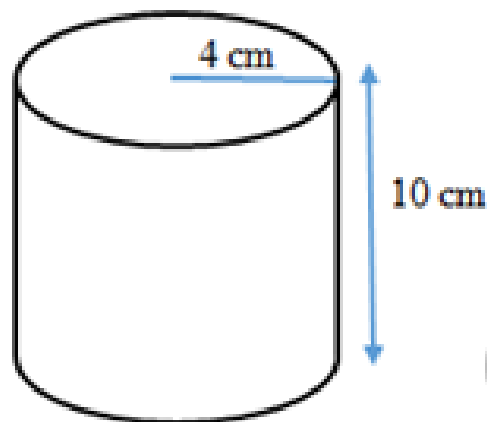
10 cm

Circle Bases

Area of 1 Circle = $50.24 cm^2$

$B = 3.14(4^2) = 50.24 cm^2$

$50.24 + 50.24$ Area of Both Circles = $100.48 cm^2$

Rectangle (Lateral Area)

Cylinder
Height of ~~Prism~~ (Width) = $10 cm$

Circumference of Circle (Length) = $25.12 cm$
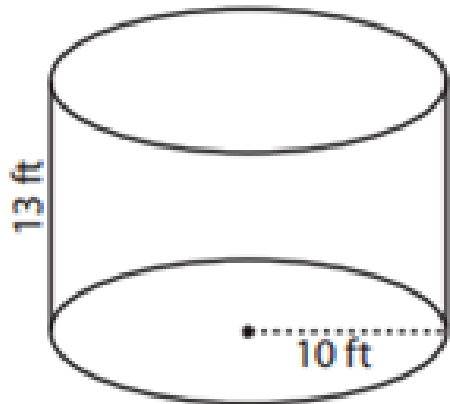
$C = 2(3.14)(4) = 25.12 cm$

Area of Rectangle = $251.2 cm^2$

$LA = 25.12(10) = 251.2 cm^2$

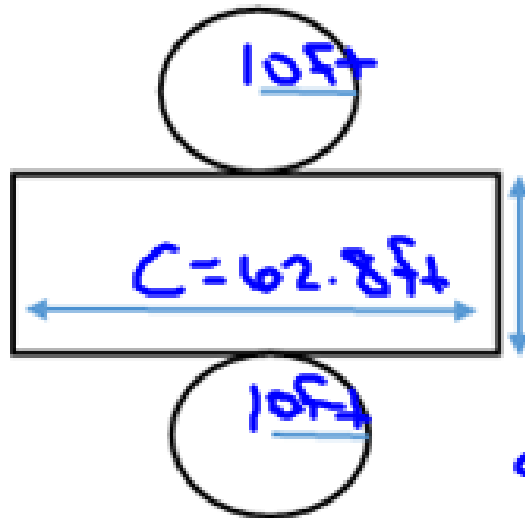Total Surface Area of Cylinder = $351.68 cm^2$

$SA = 100.48 + 251.2 = \boxed{351.68 cm^2}$

Fill in the dimensions you know on the net and find the surface area of the cylinders below. SHOW WORK

1)

13 ft

10 ft

d = 20 ft

10 ft
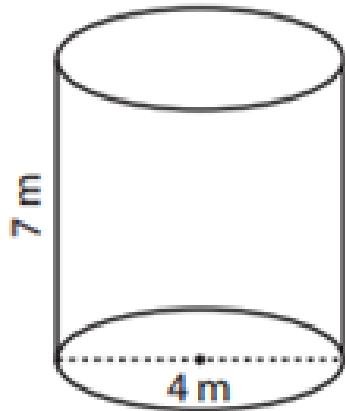
$C = 62.8$ ft

13 ft

10 ft

$C = 3.14(20) = 62.8$ ft

$LA = 62.8(13) = 816.4$ ft^2

$B = 3.14(10^2) = 314$ ft^2

$SA = 816.4 + 314 + 314$

Surface Area = 1444.4 ft^2

2)

7 m

4 m

r = 2m

2m

$C =$

7m

2m
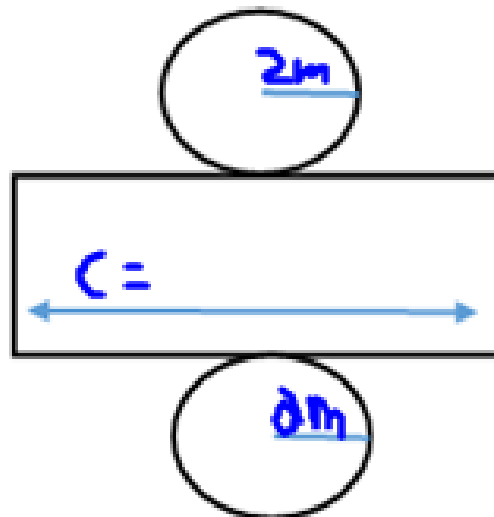
$C = 3.14(4) = 12.56$ m

$LA = 12.56(7) = 87.92$ m^2

$B = 3.14(2^2) = 12.56$ m^2

$12.56(2) = 25.12$ m^2

$SA = 87.92 + 25.12$

Surface Area = 113.04 m^2

3)

15 in

6 in

6 in

C = 37.68

15 in

6 in
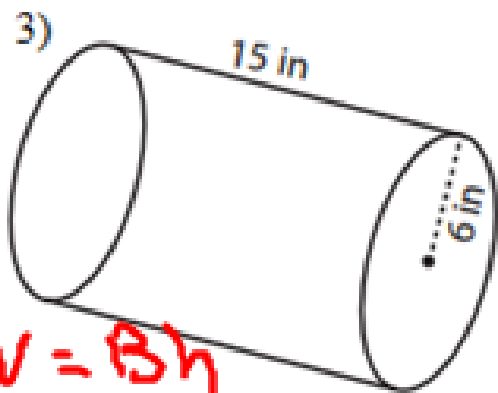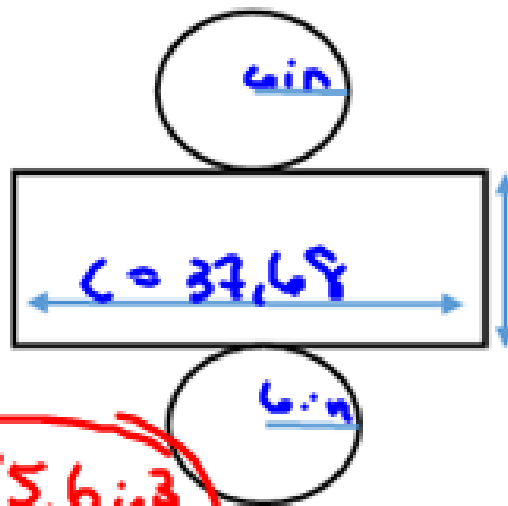
$C = 2(3.14)(6) = 37.68$ in

$LA = 37.68(15) = 565.2\ in^2$

$B = 3.14(6^2) = 113.04\ in^2$

$113.04(2) = 226.08\ in^2$

$V = Bh$

$V = 113.04(15) = 1695.6\ in^3$

$SA = 565.2 + 226.08$

Surface Area = $791.28\ in^2$

4)

11 cm

18 cm

r = 9 cm

9 cm

C = 56.52 cm

9 cm

11 cm
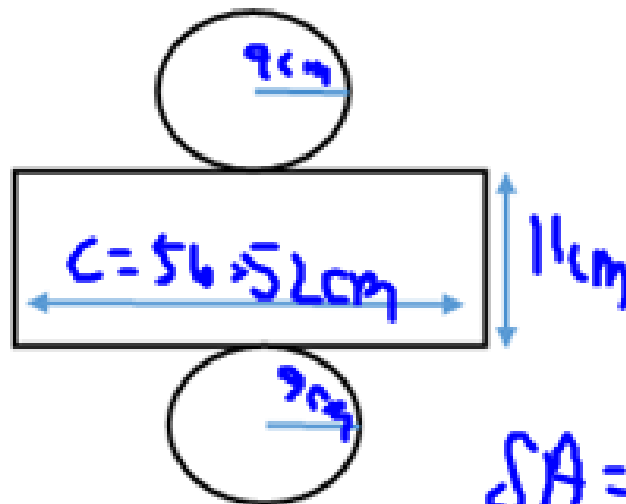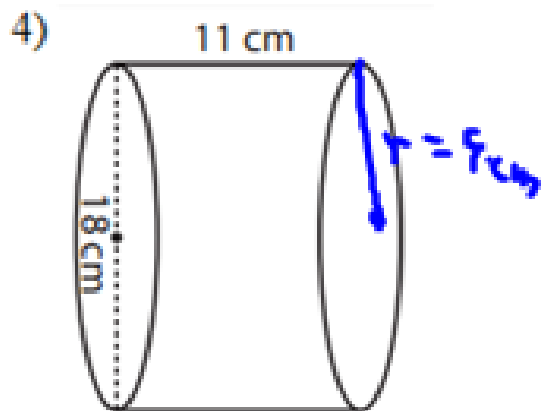
$C = 3.14(18) = 56.52$ cm

$LA = 56.52(11) = 621.72\ cm^2$

$B = 3.14(9^2) = 254.34\ cm^2$

$SA = 621.72 + 254.34 + 254.34$

Surface Area = $1130.4\ cm^2$