Grade 9 Math

Unit 1 Review for January Exam

Multiple Choice

Identify the choice that best completes the statement or answers the question.

A 1. Determine the value of $\sqrt{0.16}$.
a. 0.4 b. 0.07 c. 0.2 d. 0.04

A 2. Calculate the number whose square root is 0.9.
a. 0.81 b. 0.0081 c. 0.081 d. 0.09

A 3. Which numbers are perfect squares?
i) 30.25
ii) 32
iii) 28.9
iv) 1.44
a. i and iv b. ii and iii c. i and ii d. i and iii

B 4. Determine the value of $\sqrt{\frac{72}{98}}$.
a. $\frac{6}{14}$ b. $\frac{6}{7}$ c. $\frac{12}{7}$ d. $\frac{36}{49}$

B 5. Name the two whole numbers whose squares are closest to 22.5.
a. 9, 25 b. 4, 5 c. 4, 9 d. 16, 25

D 6. Name the two whole numbers whose squares are closest to $\frac{595}{10}$.
a. 49, 64 b. 4, 9 c. 16, 25 d. 7, 8

B 7. Estimate the value of $\sqrt{0.35}$, to the nearest tenth.
a. 0.5 b. 0.6 c. 0.59 d. 0.9

D 8. A square has an area of 24.8 cm^2.
Determine the side length of the square, to the nearest centimeter.
a. 4.98 cm b. 4.9 cm c. 5.0 cm d. 5 cm

d. I and III

B 4. Determine the value of $\sqrt{\frac{72}{98}}$. $\sqrt{\frac{36}{49}}$ 6/7 Reduce numerator denom divisable by 2.

a. $\frac{6}{14}$ (b.) $\frac{6}{7}$ c. $\frac{12}{7}$ d. $\frac{36}{49}$

B 5. Name the two whole numbers whose squares are closest to 22.5.

a. 9, 25 (81 625) (b.) 4, 5 (16 25) c. 4, 9 (16 81) d. 16, 25 (256 625)

$\sqrt{16}$ $\sqrt{22.5}$ $\sqrt{25}$ — 4 5

D 6. Name the two whole numbers whose squares are closest to $\frac{595}{10}$. 59.5

a. 49, 64 b. 4, 9 c. 16, 25 (d.) 7, 8

$\sqrt{49}$ $\sqrt{64}$ — 7 8

B 7. Estimate the value of $\sqrt{0.35}$, to the nearest tenth.

a. 0.5 (b.) 0.6 c. 0.59 d. 0.9

D 8. A square has an area of 24.8 cm^2.
Determine the side length of the square, to the nearest centimeter.

a. 4.98 cm b. 4.9 cm c. 5.0 cm (d.) 5 cm

$\sqrt{24.8}$ 4.97995 A = l x w

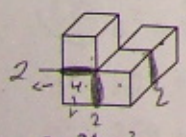
C 9. The lengths of the two legs of a right triangle are 6.7 cm and 3.2 cm.
Determine the length of the hypotenuse to 1 decimal place.

a. 55.1 cm b. 5.9 cm (c.) 7.4 cm d. 3.1 cm

hypotenuse. 6.7 x 3.2

$c^2 = a^2 + b^2$
$x^2 = 6.7^2 + 3.2^2$
$x^2 = 44.89 + 10.24$
$x^2 = 55.13$
$x = 7.4$

D 10. This composite object is made using centimetre cubes. Determine its surface area.



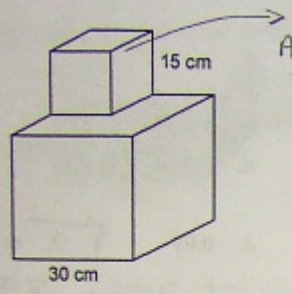
a. 24 cm^2 b. 20 cm^2 c. 15 cm^2 (d.) 18 cm^2

1 cube = 6
6 x 4 = 24
Surface Area = Area of all visible sides.
for each connection we lose 2 visible sides.

24 - overlap
24 - (6) ← 3 overlaps.
3 x 2 = 6 lost sides.

C

11. This composite object is made of a 15-cm cube on top of a 30-cm cube.
Determine its surface area.



Cube
$A = L \times w$
$= 15 \times 15$
$= 225$
$\times 6$ sides
1350

Cube
$A = L \times w$
$= 30 \times 30$
$= 900$
$\times 6$ sides
5400

overlap
$A = L \times w$
$= 15 \times 15$
$= 225$
$\times 2$
450

Area of Cube $= (l \times w)6$

$1350 + 5400 - 450 = 6300$

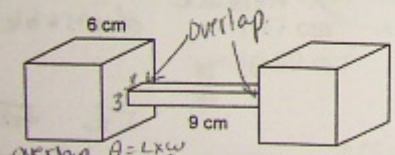
C

a. 6750 cm^2 b. 5625 cm^2 (c.) 6300 cm^2 d. 6525 cm^2

C

12. This object is composed of two identical cubes joined by a right rectangular prism.
The edge length of each cube is 6 cm.
The rectangular prism is 9 cm long and has square ends of side length 3 cm.
Determine the surface area of the object.

216
216
126
558
$-$ 36 overlap
522



overlap $A = L \times w$
$= 3 \times 3$
$= 9 \times 4$
36

Cube
$A = L \times w$
$= 6 \times 6$
$= 36$
$\times 6$ sides
216

Cube
identical
216

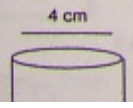
Rec. Prism
Top/B | Front/Back | Side/Side
$A = L \times w$ | $A = L \times w$ | $A = L \times w$
$= 9 \times 3$ | $= 9 \times 3$ | $= 3 \times 3$
$= 27 \times 2$ | $= 27 \times 2$ | $= 9 \times 2$
$= 54$ | $= 54$ | $= 18$
126

a. 540 cm^2 b. 558 cm^2 (c.) 522 cm^2 d. 324 cm^2

D

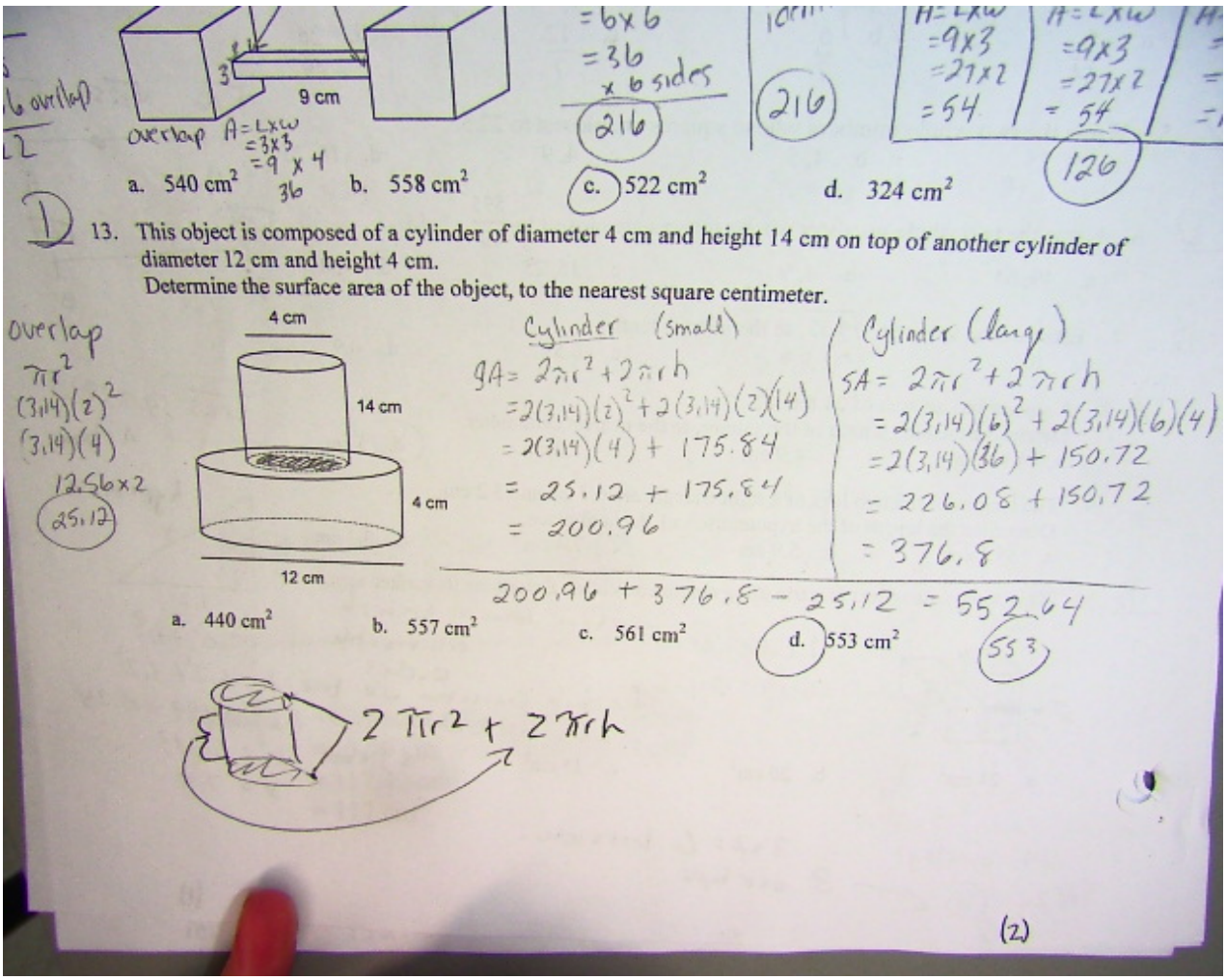
13. This object is composed of a cylinder of diameter 4 cm and height 14 cm on top of another cylinder of diameter 12 cm and height 4 cm.
Determine the surface area of the object, to the nearest square centimeter.

overlap
πr^2



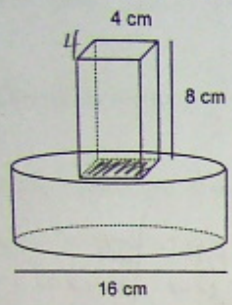
Cylinder (small)
$SA = 2\pi r^2 + 2\pi rh$

Cylinder (large)
$SA = 2\pi r^2 + 2\pi rh$


3
9 cm
overlap A=LxW
=3x3
=9 x 4
36
=6x6
=36
x 6 sides
216
216
A=LxW
=9x3
=27x2
=54
A=LxW
=9x3
=27x2
=54
126
a. 540 cm²
b. 558 cm²
c. 522 cm²
d. 324 cm²
D
13. This object is composed of a cylinder of diameter 4 cm and height 14 cm on top of another cylinder of diameter 12 cm and height 4 cm.
Determine the surface area of the object, to the nearest square centimeter.
overlap
πr²
(3.14)(2)²
(3.14)(4)
12.56x2
25.12
4 cm
14 cm
4 cm
12 cm
Cylinder (small)
SA= 2πr²+2πrh
=2(3.14)(2)²+2(3.14)(2)(14)
=2(3.14)(4)+175.84
= 25.12 + 175.84
= 200.96
Cylinder (larg)
SA= 2πr²+2πrh
=2(3.14)(6)²+2(3.14)(6)(4)
=2(3.14)(36)+150.72
= 226.08 + 150.72
= 376.8
200.96 + 376.8 - 25.12 = 552.64
a. 440 cm²
b. 557 cm²
c. 561 cm²
d. 553 cm²
553
2 πr² + 2πrh
(2)

C

14. This object is composed of a rectangular prism on top of a cylinder.
The rectangular prism has height 8 cm and square ends of side length 4 cm.
The cylinder has diameter 16 cm and height 6 cm.
Determine the surface area of the object, to the nearest square centimeter.



overlap
A = LxW
= 4x4
= 16x2
= 32

Rectangular Prism

T/B	F/B	S/S
A = LxW	A = LxW	A = LxW
= 4x4	= 8x4	= 8x4
= 16x2	= 32x2	= 32x2
32	= 64	= 64

160

Cylinder
$SA = 2\pi r^2 + 2\pi rh$
$= 2(3.14)(8)^2 + 2(3.14)(8)(6)$
$= 2(3.14)(64) + 301.44$
$= 401.92 + 301.44$
$= 703.36$

$160 + 703.36 - 32 = 831.36$ → 832

a. 631 cm² b. 816 cm² c. 832 cm² d. 848 cm²

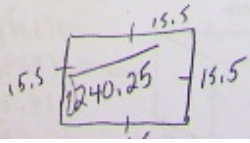
Short Answer

15. Determine the value of $\sqrt{2.89}$. 1.7

16. Determine the value of $\sqrt{\frac{25}{36}}$. 5/6

17. Determine the value of $\sqrt{6 \times 3 \times 18}$. $\sqrt{324} = 18$

18. A square garden has an area of 240.25 m².
a) Determine the length of one side of the garden.
b) Determine the perimeter of the garden.

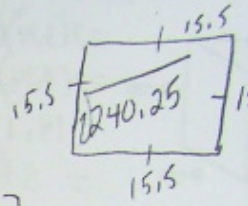


P = 62

16. Determine the value of $\sqrt{\frac{25}{36}}$. 5/6

17. Determine the value of $\sqrt{6 \times 3 \times 18}$. $\sqrt{324}$ = 18

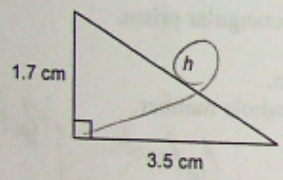
18. A square garden has an area of 240.25 m^2.
    a) Determine the length of one side of the garden.
    b) Determine the perimeter of the garden.



P = 62

19. Determine the value of $\sqrt{0.27}$, to the nearest tenth. 0.52

20. Determine the length of the hypotenuse, *h*.



$c^2 = a^2 + b^2$

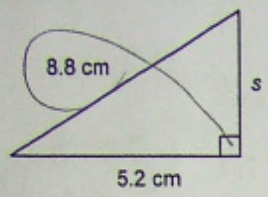
$h^2 = 1.7^2 + 3.5^2$

$h^2 = 2.89 + 12.25$

$h^2 = 15.14$

$h = 3.89$

21. Determine the length of side s.



$c^2 = a^2 + b^2$

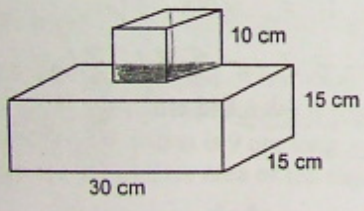
$8.8^2 = s^2 + 5.2^2$

$77.44 = s^2 + 27.04$

$50.4 = s^2$

$7.1 = s$

22. This object is composed of a cube on top of a right rectangular prism. Determine the surface area of the object.



Overlap
$A = L \times W$
$= 10 \times 10$
$= 100$
$\times 2$
200

Cube
$A = L \times W$
$= 10 \times 10$
$= 100 \times 6$
$= 600$

Rec. Prism

T/B	F/B	S/S
$A = L \times W$	$A = L \times W$	$A = L \times W$
$= 30 \times 15$	$= 30 \times 15$	$= 15 \times 15$
$= 450 \times 2$	$= 450 \times 2$	$= 225$
$= 900$	$= 900$	$\times 2$
		$= 450$

2250

$600 + 2250 - 200 = 2650$

23. Determine the surface area of this composite object, to the nearest square centimeter.
The cylinder has diameter 3 cm and height 4 cm.
The prism has length 10 cm, width 9 cm, and height 9 cm.

Overlap
$A = \pi r^2$

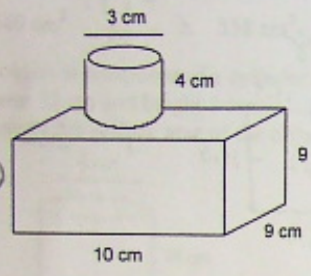
Cylinder
$SA = 2\pi r^2 + 2\pi rh$

Rectangular

T/B F/B

200 600+2250-200 = 2650 2250

23. Determine the surface area of this composite object, to the nearest square centimeter.
The cylinder has diameter 3 cm and height 4 cm.
The prism has length 10 cm, width 9 cm, and height 9 cm.



Overlap
$A=\pi r^2$
$=(3.14)(1.5)^2$
$=(3.14)(2.25)$
$=7.065_{x2}$
$=14.13$

Cylinder
$SA=2\pi r^2+2\pi rh$
$=2(3.14)(1.5)^2+2(3.14)(1.5)(4)$
$=2(3.14)(2.25)+37.68$
$=14.13+37.68$
$=51.81$

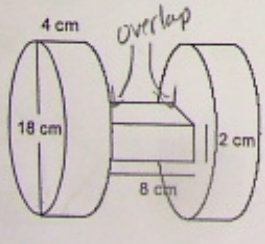
Rectangular Prism

T/B	F/B	S/S
A=LxW	A=LxW	A=LxW
=10x9	=10x9	=9x9
=90x2	=90x2	=81x2
=180	=180	=162

522

51.81 + 522 − 14.13 = 559.68

24. This object is composed of two identical cylinders connected by a right rectangular prism.
Each cylinder has diameter 18 cm and height 4 cm.
The rectangular prism has length 8 cm and square ends of side length 2 cm.
Determine the surface area of the object. Give your answer to the nearest whole number.



Overlap
$A=LxW$
$=2x2$
$=4_{x4}$
$=16$

Cylinder
$SA=2\pi r^2+2\pi rh$
$=2(3.14)(9)^2+2(3.14)(9)(4)$
$=2(3.14)(81)+226.08$
$=508.68+226.08$
$=734.76$

Cylinder
Identical
734.76

Rectangular Prism

F/B	T/B	S/S
A=LxW	A=LxW	A=LxW
A=8x2	=8x2	=2
=16x2	=16x2	=4
=32	=32	

72

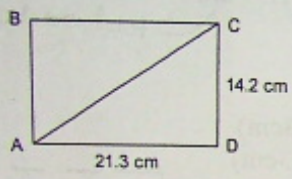
734.76 + 734.76 + 72 − 16
1525.52

Problem

25. Determine the value of $\sqrt{6.47+7.36+17.53}$. $= \sqrt{31.36} = 5.6$

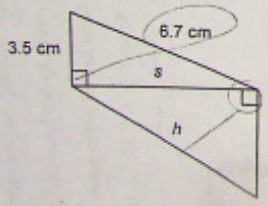
26. Determine the value of $\sqrt{\frac{\sqrt{81}+\sqrt{49}}{\sqrt{196}-\sqrt{100}}}$. $= \sqrt{\frac{9+7}{14-10}} = \sqrt{\frac{16}{4}} = \sqrt{4} = 2$

27. Determine the length of the diagonal AC of rectangle ABCD, to the nearest centimeter.



$c^2 = a^2 + b^2$
$c^2 = 21.3^2 + 14.2^2$
$c^2 = 453.69 + 201.64$
$c^2 = 655.33$
$c = 25.6$

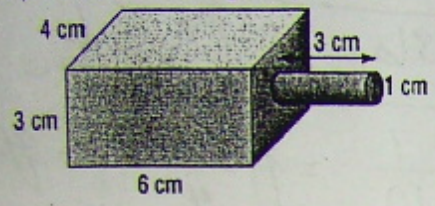
28. Determine the values of s and h. Show your work.



(s)
$c^2 = a^2 + b^2$
$6.7^2 = 3.5^2 + s^2$
$44.89 = 12.25 + s^2$
$32.64 = s^2$
$5.7 = s$

(h)
$c^2 = a^2 + b^2$
$h^2 = 4.4^2 + 5.7^2$
$h^2 = 19.36 + 32.64$
$h^2 = 52$
$h = 7.2$

3 b) cylinder on a rectangular prism



Overlap:

Area of circle = πr^2
= (3.14) (0.5 cm)^2
= (3.14) 0.25 cm^2
= 0.785 cm^2

X 2 since 2 faces involved

1.57 cm^2 ← total overlap

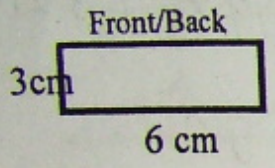
Area of cylinder = $2\pi r^2 + 2\pi rh$
= $2(3.14)(0.5\text{cm})^2 + 2(3.14)(0.5\text{cm})(3\text{cm})$
= $2(3.14)(0.25\text{cm}) + 2(3.14)(0.5\text{cm})(3\text{cm})$
= 1.57 cm^2 + 9.42 cm^2
= 10.99 cm^2

Rectangular Prism

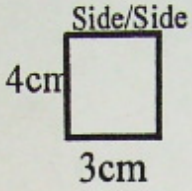
Side/Side Top / Bottom

is it a perfect square take
square root of fraction take
bench marks find the perfect
Perfect Squares: 1, 4, 9, 16

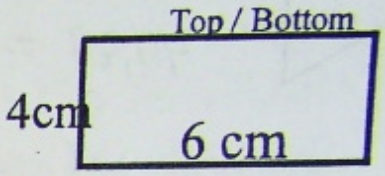
Rectangular Prism



A = 3cm x 6 cm
= 18 cm^2

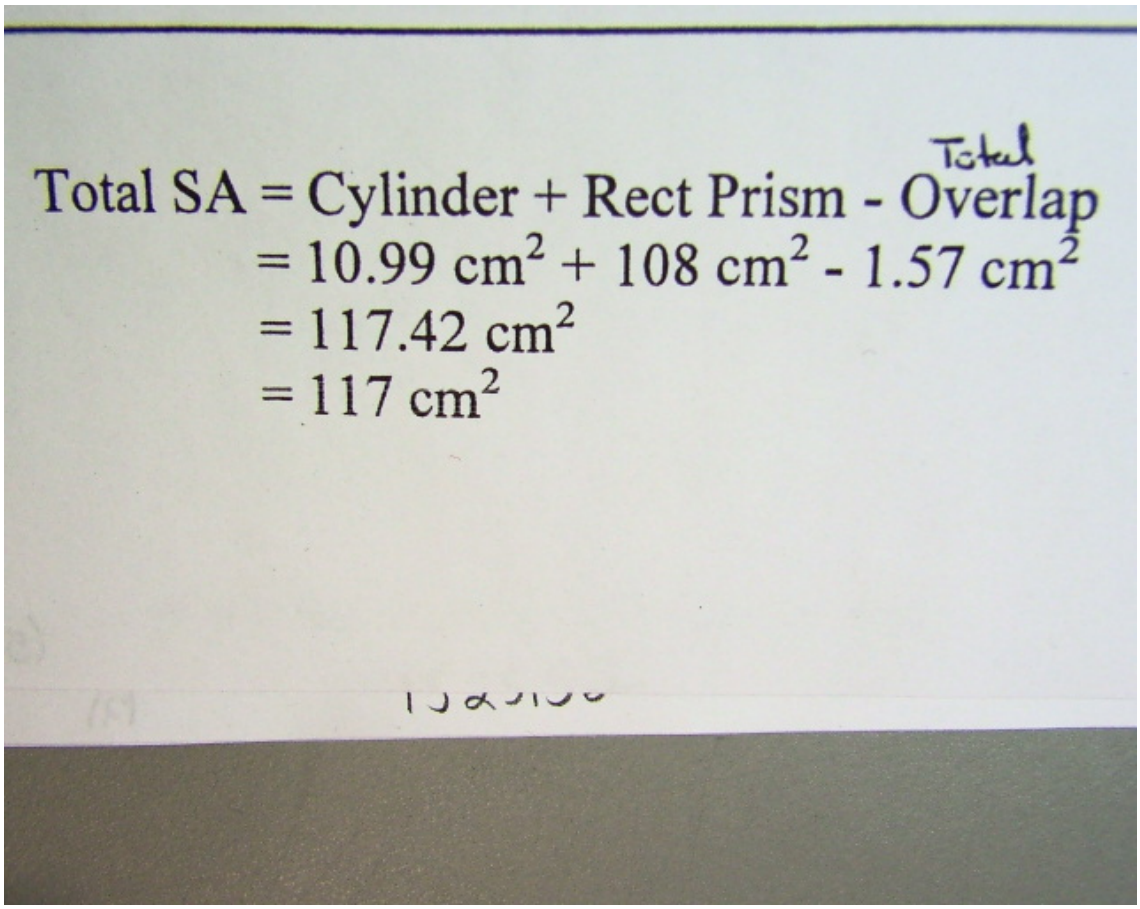


A = 3cm x 4 cm
= 12 cm^2



A = 4cm x 6 cm
= 24 cm^2

Rectangular Prism SA = $2(18\ cm^2) + 2(12cm^2) + 2(24cm^2)$
$= 36\ cm^2 + 24cm^2 + 48cm^2$
$= 108cm^2$


Total SA = Cylinder + Rect Prism - Overlap
Total
= 10.99 cm² + 108 cm² - 1.57 cm²
= 117.42 cm²
= 117 cm²