Composite Objects Assignment

① Find surface area of all objects
② Locate and Calculate Overlap
③ Determine Total Surface Area

1. Small rectangular prism

Front / Back	Side / Side	Top Bottom
A = L x w	A = L x w	A = L x w
= 8 x 10	= 5 x 8	= 5 x 10
= 80	= 40	= 50
x 2	x 2	x 2
160	80	100

SA = 160 + 80 + 100
= 340 cm²

Large rectangular Prism

Front / Back	Side / Side	Top / Bottom
A = L x w	A = L x w	A = L x w
= 20 x 15	= 12 x 15	= 20 x 12
= 300	= 180	= 240
x 2	x 2	x 2
600	360	480

SA = 600 + 360 + 480
= 1440 cm²

Overlap

A = L x w
= 10 x 5
= 50
x 2
100

Total Surface Area
= Small + Large − overlap
340 + 1440 − 100
1680 cm²

2. Cylinder

$SA = 2\pi r^2 + 2\pi rh$
$= 2(3.14)(6)^2 + 2(3.14)(6)(10)$
$= 2(3.14)(36) + 376.8$
$= 226.08 + 376.8$
$= 602.88 \text{ mi}^2$

Rectangular Prism

Front / Back	Side / Side	Top / Bottom
A = L x w	A = L x w	A = L x w
= 15 x 4	= 12 x 4	= 15 x 12
= 60	= 48	= 180
x 2	x 2	x 2
120	96	360

SA = 120
96
+ 360
576 mi²

Overlap

$A = \pi r^2$
$= (3.14)(6)^2$
$= (3.14)(36)$
$= 113.04$
x 2
226.08 mi²

Total Surface Area = Cylinder + Rectangular Prism − Overlap
= 602.88 + 576 − 226.08
= 952.8 mi²

3. Small Cylinder

$SA = 2\pi r^2 + 2\pi rh$
$= 2(3.14)(3)^2 + 2(3.14)(3)(8)$
$= 2(3.14)(9) + 150.72$
$= 56.52 + 150.72$
$= 207.24\ Km^2$

Large Cylinder

$SA = 2\pi r^2 + 2\pi rh$
$= 2(3.14)(11)^2 + 2(3.14)(11)(6)$
$= 2(3.14)(121) + 414.48$
$= 759.88 + 414.48$
$= 1174.36\ Km^2$

Overlap

$A = \pi r^2$
$= (3.14)(3)^2$
$= (3.14)(9)$
$= 28.26$
$\times 2$
$56.52\ Km^2$

Total Surface Area = Small Cylinder + Large − Overlap
$= 207.24 + 1174.36 - 56.52$
$= 1325.08\ Km^2$

4. Top Rec. Prism

Front / Back	Side / Side	Top / Bottom	
$A = L \times w$	$A = L \times w$	$A = L \times w$	$SA = 400 + 100 + 32$
$= 8 \times 25$	$= 2 \times 25$	$= 8 \times 2$	$= 532\ Km^2$
$= 200$	50	$= 16$	
$\times 2$	$\times 2$	$\times 2$	
400	100	32	

Middle Rec. Prism

Front / Back	Side / Side	Top / Bottom	
$A = L \times w$	$A = L \times w$	$A = L \times w$	$SA = 440 + 220 + 400$
$= 20 \times 11$	$= 10 \times 11$	$= 20 \times 10$	$= 1060\ Km^2$
$= 220$	$= 110$	$= 200$	
$\times 2$	$\times 2$	$\times 2$	
440	220	400	

Bottom Rec. Prism

Front / Back	Side / Side	Top Bottom	
$A = L \times w$	$A = L \times w$	$A = L \times w$	$SA = 140 + 60 + 42$
$= 10 \times 7$	$= 10 \times 3$	$= 7 \times 3$	$= 242\ Km^2$
$= 70$	$= 30$	$= 21$	
$\times 2$	$\times 2$	$\times 2$	
140	60	42	

Overlap $(32 + 42 = 74)$

$A = L \times w$
$= 8 \times 2$
$= 16$
$\times 2$
$32\ Km^2$

$A = L \times w$
$= 7 \times 3$
$= 21$
$\times 2$
$42\ Km^2$

Total Surface Area
Top + Middle + Bottom − Overlap
$532 + 1060 + 242 - 74$
$1760\ Km^2$

5. Top Rec. Prism

Front/Back	Side/Side	Top/Bottom
$A = L \times w$	$A = L \times w$	$A = L \times w$
$= 8 \times 2$	$= 2 \times 3$	$= 3 \times 8$
$= 16$	$= 6$	$= 24$
$\times 2$	$\times 2$	$\times 2$
32	12	48

$SA = 32 + 12 + 48$
$= 92 cm^2$

Middle Cylinder

$SA = 2\pi r^2 + 2\pi rh$
$= 2(3.14)(12)^2 + 2(3.14)(12)(5)$
$= 2(3.14)(144) + 376.8$
$= 904.32 + 376.8$
$= 1281.12 cm^2$

Bottom Cylinder

$SA = 2\pi r^2 + 2\pi rh$
$= 2(3.14)(6)^2 + 2(3.14)(6)(20)$
$= 2(3.14)(36) + 753.6$
$= 226.08 + 753.6$
$= 979.68 cm^2$

Overlap ($48 + 226.08 = 274.08$)

$A = L \times w$
$= 8 \times 3$
$= 24$
$\times 2$
$48 cm^2$

$A = \pi r^2$
$= (3.14)(6)^2$
$= (3.14)(36)$
$= 113.04$
$\times 2$
$226.08 cm^2$

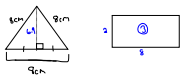
Total Surface Area

Top Rec. Prism + Middle Cylinder + Bottom − Overlap
$92 + 1281.12 + 979.68 - 274.08$
$2078.72 cm^2$

6)

$a^2 = c^2 - b^2$
$a^2 = 8^2 - 4^2$
$a^2 = 64 - 16$
$a^2 = 48$
$a = 6.9 cm$

Prisms:



$A = \frac{b \times h}{2}$
$A = \frac{8 \times 6.9}{2}$
$A = \frac{55.2}{2}$
$A = 27.6 cm^2$
$2A = 55.2 cm^2$

$A = bh$
$A = 8 \times 2$
$A = 16 cm^2$
$3A = 48 cm^2$

$SA = 2A + 3\square$
$= 55.2 + 48$
$= 103.2 cm^2$

There are 2 triangle prism so

$2SA = 206.4 cm^2$

Cylinder:

$SA = 2\pi r^2 + 2\pi rh$
$= 2(3.14)(5)^2 + 2(3.14)(5)(12)$
$= 2(3.14)(25) + 2(3.14)(5)(12)$
$= 157 + 376.8$
$= 533.8 cm^2$

Overlap (4 circles)

$A_o = \pi r^2$
$A_o = (3.14)(5)^2$
$A_o = 3.14(25)$
$A_o = 78.5 cm^2$

$4A_o = 314 cm^2$

T_{SA} = 2 Triangle prisms + cylinder − overlap
$= 206.4 cm^2 + 533.8 cm^2 - 314 cm^2$
$= 426.2 cm^2$