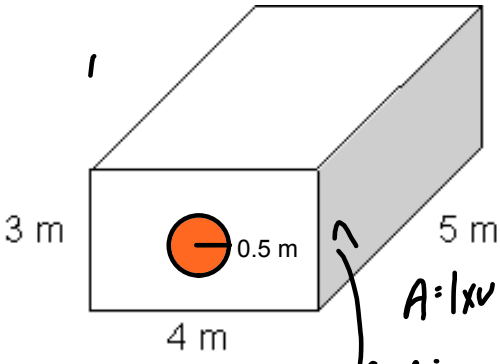
Section 1.4

Find the surface area of the following object that has a hole all the way through



Cylinder

$2\pi r^2 + 2\pi rh$

Rectangular Prism SA

Front Back: $(3m \times 4m) \times 2$, $(12m^2) \times 2$, $= 24m^2$

Sides: $(A = l \times w)$, $(5m \times 3m) \times 2$, $(15m^2) \times 2$, $30m^2$

Top + Bottom: $(4m \times 5m) \times 2$, $(20m^2) \times 2$, $40m^2$

Total: $24m^2 + 30m^2 + 40m^2$

$\therefore 94m^2$

$2\pi r^2$

$2\pi(0.5)^2$

$2\pi(0.25)$

1.57

Surface

$94m^2 - 1.57m^2 = 92.43m^2$

Homework solutions

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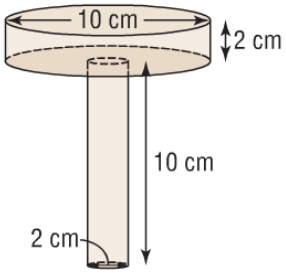
3c c) cylinder on a cylinder



Overlap:

Area of circle = πr^2
$= (3.14)(1\ cm)^2$
$= (3.14)\ 1\ cm^2$
$= 3.14\ cm^2$

X 2 since 2 faces involved

$6.28\ cm^2$

long tube

Area of cylinder = $2\pi r^2 + 2\pi rh$
$= 2(3.14)(1cm)^2 + 2(3.14)(1cm)(10cm)$
$= 2(3.14)(1cm) + 2(3.14)(1cm)(10cm)$
$= 6.28\ cm^2 + 62.8\ cm^2$
$= 69.08\ cm^2$

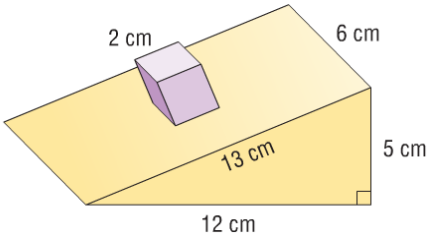
puck shape

Area of 2nd cylinder = $2\pi r^2 + 2\pi rh$
$= 2(3.14)(5cm)^2 + 2(3.14)(5cm)(2cm)$
$= 2(3.14)(25cm) + 2(3.14)(5cm)(2cm)$
$= 157\ cm^2 + 62.8cm^2$
$= 219.8\ cm^2$

Total SA = Cylinder + Cylinder - Overlap
$= 69.08\ cm^2 + 219.8\ cm^2 - 6.28\ cm^2$
$= 282.6\ cm^2$
$= 283\ cm^2$

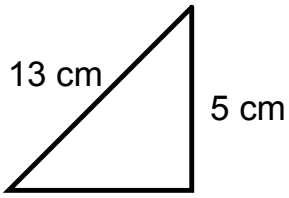
Homework solutions

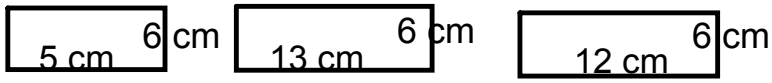
3e) cube on a triangular prism



Overlap:

Area of square = l x w
= (2 cm) (2 cm)
= 4 cm^2
x 2 since 2 faces involved
8 cm^2





A= 6 cm x 5 cm = 30cm^2

A= 6 cm x 13 cm =78cm^2

A= 6 cm x 12 cm =72cm^2

Area of Triangle = $\frac{b \times h}{2}$

= $\frac{12\ cm \times 5\ cm}{2}$

= $\frac{60\ cm^2}{2}$

= 30 cm^2

Surface Area of Triangular Prism = 2 Triangles + Rectangle + Rectangle + Rectangle
= 2 (30 cm^2) + 30 cm^2 + 78 cm^2 + 72 cm^2
= 60 cm^2 + 30 cm^2 + 78 cm^2 + 72 cm^2
= 240 cm^2

Cube
Area of 1 face = 2 cm x 2 cm
= 4 cm^2

6 equal faces

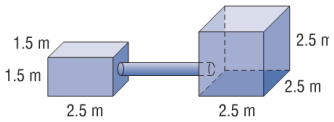
Surface area of cube
thus 4cm^2 x 6 = 24 cm^2

Total SA = Triangular Prism + Cube - Overlap
= 240 cm^2 + 24 cm^2 - 8 cm^2
= 256 cm^2
=

Homework solutions

Solutions

4 b) The cylinder is 3.5 m long with diameter 0.5 m.



overlap 1

$A = \pi r^2$
$= (3.14)(0.25m)^2$
$= (3.14)(0.0625m)$
$= 0.19625\ m^2$
x 2 for face involved
$=0.3925 m^2$

Overlap 2

$A = \pi r^2$
$= (3.14)(0.25m)^2$
$= (3.14)(0.0625m)$
$= 0.19625 m^2$
x 2 for face involved
$=0.3925\ m^2$

total overlap = overlap 1 + overlap 2
$0.3925\ m^2 + 0.3925\ m^2$
$= 0.785\ m^2$

Area of cylinder $= 2\pi r^2 + 2\pi rh$
$= 2(3.14)(0.25m)^2 + 2(3.14)0.25m)(3.5m)$
$= 2(3.14)(0.0625m^2) + 2(3.14)(0.25cm)(3.5m)$
$= 0.3925\ m^2 + 5.495\ m^2$
$= 5.8875\ m^2$

Prism 1)

Front/back: 2.5m × 1.5 m
A= 1.5 m x 2.5 m
= 3.75 m²

side/side: 1.5 m × 1.5 m
A= 1.5 m x 1.5 m
= 2.25 m²

Top/Bottom: 1.5 m × 2.5m
A= 1.5 m x 2.5 m
= 3.75 m²

SA Prism 1 = $2(3.75\ m^2) + 2(2.25m^2) + 2(3.75m^2)$
$= 7.5\ m^2 + 4.5m^2 + 7.5m^2$
$= 19.5\ m^2$

Cube)

Surface area of 1 face = 2.5 m x 2.5m
$= 6.25\ m^2$
x 6 ← 6 equal faces
$37.5\ m^2$

Total SA= Rectangular Prism + Cube + Cylinder - Total Overlap
$= 19.5\ m^2 + 37.5\ m^2 + 5.8875\ m^2 - 0.785\ m^2$

$= 61.6025\ m^2$

Or if you rounded to the nearest thenth

Total SA= Rectangular Prism + Cube + Cylinder - Total Overlap
$= 19.5\ m^2 + 37.5\ m^2 + 5.8875\ m^2 - 0.785\ m^2$
$= 19.5\ m^2 + 37.5\ m^2 + 5.9\ m^2 - 0.8\ m^2$
$= 62.1\ m^2$

Test
Wednesday, Nov 26, 2014

Square roots and perfect squares

Surface area of composite objects

Class / Homework

Review For Test

Questions :

page 45

#2(a, c, e, g)
#4(a, b)
#5 (a, c, e)
#7 (a, b, c)

Use the Calculator

Page 46

15(b, c)
16 (a)
#19a

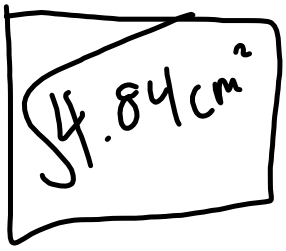
Homework

If finished work do question from page 48

2b) $\sqrt{\frac{225}{64}}$

$= \sqrt{\frac{15}{8}}$

4d) $0.8 \rightarrow 0.64$ $\sqrt{x}$

5b) 

$A = l \times w$

$A = 2.42 \times 2.42$

$(2.42)^2$

7a) $\sqrt{\frac{15}{39}}$

9 → 3

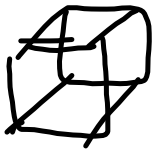
16 → 4

$\sqrt{\frac{3.9}{6.2}}$

39 36 → 6

49 → 7

$1 = 1$
$2 = 4$
$3 = 9$
$4 = 16$
$5 = 25$
$6 = 36$
$7 = 49$
$8 = 64$
$9 = 81$
$10 = 100$

15 cm  = We have 4 cubes.

# of cubes

6 x 4 = 24 cm²

Area of 1 cube

SA of 6 cubes.

a) Side length = 1

$A_D = l \times w$

$A = 1 \times 1$

$A = 1$

$A_\square = 1 \times 6$

$= 6$

b) we have 3 overlaps and lose 2 sides per overlap.

$3 \times 2 = 6$ lost $6\ cm^2$

$24\ cm^2 - 6\ cm^2$

$= 18\ cm^2$