Page 30 - # 4

a) 

b) 

c) 

d) 

e) 

f) 

a) $SA_{\underline{f\&b}} = 2(\quad) =$
$SA_{\underline{t\&b}} = 2(\quad) =$
$SA_{\underline{r\&l}} = 2(\quad) =$
$TSA =$

b) $SA_{\underline{f\&b}} = 2(\quad) =$
$SA_{\underline{t\&b}} = 2(\quad) =$
$SA_{\underline{r\&l}} = 2(\quad) =$
$TSA =$

c) $SA_{\underline{f\&b}} = 2(\quad) =$
$SA_{\underline{t\&b}} = 2(\quad) =$
$SA_{\underline{r\&l}} = 2(\quad) =$
$TSA =$

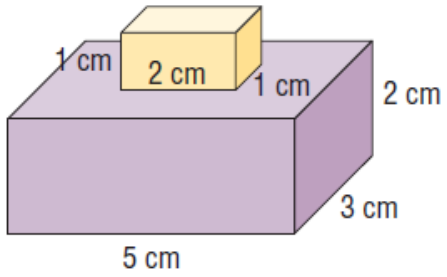
d) $SA_{\underline{f\&b}} = 2(\quad) =$
$SA_{\underline{t\&b}} = 2(\quad) =$
$SA_{\underline{r\&l}} = 2(\quad) =$
$TSA =$

e) $SA_{\underline{f\&b}} = 2(\quad) =$
$SA_{\underline{t\&b}} = 2(\quad) =$
$SA_{\underline{r\&l}} = 2(\quad) =$
$TSA =$

f) $SA_{\underline{f\&b}} = 2(\quad) =$
$SA_{\underline{t\&b}} = 2(\quad) =$
$SA_{\underline{r\&l}} = 2(\quad) =$
$TSA =$

#8 Page 31

a)



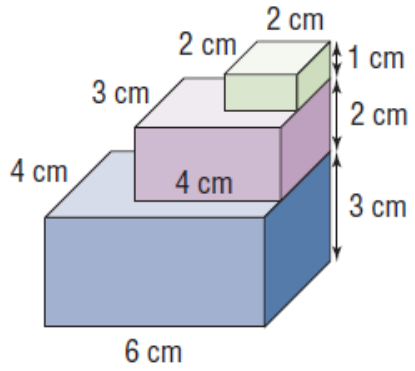
$SA_{sm\ rec}$ = 2(top) + 2(front) + 2(side)
= 2(2 x 1) + 2(2 x 1) + 2(1 x 1)
= 4 + 4 + 2
= $10cm^2$

$SA_{lg\ rec}$ = 2(top) + 2(front) + 2(side)
= 2(5 x 3) + 2(5 x 2) + 2(3 x 2)
= 30 + 20 + 12
= $62cm^2$

$SA_{overlap}$ = 2(2 x 1)
= $4cm^2$

TSA = SA_{sm} + SA_{lg} - $SA_{overlap}$
= 10 + 62 - 4
= $68cm^2$

b)



SA_{green} = 2(top) + 2(front) + 2(side)
= 2(2 x 2) + 2(2 x 1) + 2(2 x 1)
= 8 + 4 + 4
= $16cm^2$

SA_{purple} = 2(top) + 2(front) + 2(side)
= 2(4 x 3) + 2(4 x 2) + 2(3 x 2)
= 24 + 16 + 12
= $52cm^2$

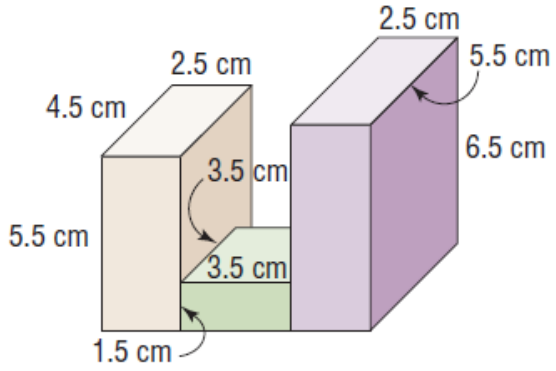
SA_{blue} = 2(top) + 2(front) + 2(side)
= 2(6 x 4) + 2(6 x 3) + 2(4 x 3)
= 48 + 36 + 24
= $108cm^2$

$SA_{overlap1}$ = 2(2 x 2)
= $8cm^2$

$SA_{overlap2}$ = 2(4 x 3)
= $24cm^2$

TSA = SA_{green} + SA_{purple} + SA_{blue} - $SA_{overlap1}$ - $SA_{overlap2}$
= 16 + 52 + 108 - 8 - 24
= $144cm^2$

c)



SA_1 = 2(top) + 2(front) + 2(sides)
= 2(4.5 x 2.5) + 2(5.5 x 2.5) + 2(4.5 x 5.5)
= 22.5 + 27.5 + 49.5
= $99.5cm^2$

SA_2 = 2(top) + 2(front) + 2(sides)
= 2(3.5 x 3.5) + 2(1.5 x 3.5) + 2(3.5 x 1.5)
= 24.5 + 10.5 + 10.5
= $45.5cm^2$

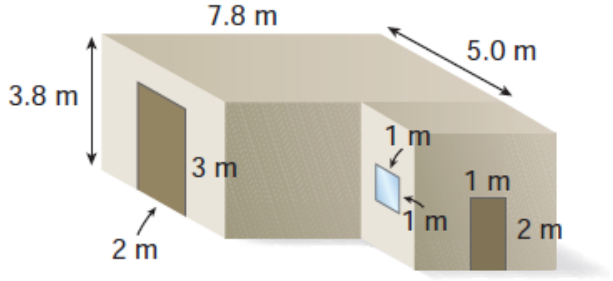
SA_3 = 2(top) + 2(front) + 2(sides)
= 2(5.5 x 2.5) + 2(2.5 x 6.5) + 2(5.5 x 6.5)
= 27.5 + 32.5 + 71.5
= $131.5cm^2$

SA_{ov1} = 2(3.5 x 1.5)
= $10.5cm^2$

SA_{ov2} = 2(3.5 x 1.5)
= $10.5cm^2$

TSA = $SA_1 + SA_2 + SA_3 - SA_{ov1} - SA_{ov2}$
= 99.5 + 45.5 + 131.5 - 10.5 - 10.5
= $255.5cm^2$

#10 Page 31



** shed is 1/2 as long and 1/2 half as wide

a) SA_{garage} = 1(top) + 2(front) +2(side)
= (7.5 x 5) + 2(3.8 x 5) + 2(7.8 x 3.8)
= 39 + 38 + 59.28
= $136.28cm^2$

SA_{shed} = 1(top) + 2(front) + 2(side)
= (3.9 x 2.5) + 2(3.9 x 3.8) + 2(2.5 x 3.8)
= 9.75 + 29.64 + 19
= $58.39cm^2$

$SA_{overlap}$ = 2(3.9 x 3.8)
= $29.64cm^2$

TSA = $SA_{garage} + SA_{shed} - SA_{overlap}$
= 136.28 + 58.39 - 29.64
= $165.03cm^2$

b) Siding cost $\$15.00/m^2$

Remove doors = (2 x 3) + (2 x 1)
= $8cm^2$

Remove windows = (1 x 1)
= $1cm^2$

Remove roof = (7.8 x 5.0) + (3.9 x 2.5)
= 39 + 9.75
= $48.75m^2$

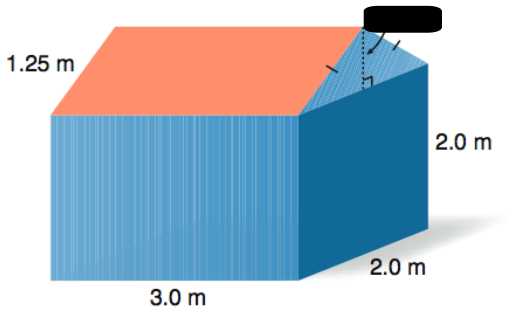
Total to be removed = 8 + 1 + 48.75
= $57.75m^2$

SA = 165.03 - 57.75
= $107.28m^2$

Cost = 107.28 x $\$15.00/m^2$
= $1609.20

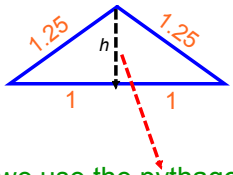
page 41 #7

a) A playhouse has the shape of a rectangular prism with a triangular prism roof. Determine the surface area of the playhouse.



Note:
- we will include the floor of the playhouse
- we must find the height of the base triangle first

To find height...



we use the pythagorean theorem

$c^2 - b^2 = a^2$
$1.25^2 - 1^2 = a^2$
$1.5625 - 1 = a^2$
$0.5625 = a^2$
$\sqrt{0.5625} = a$
$0.75 = a$
height = 0.75m

SA_{roof} = 2(area) + $area_1$ + $area_2$ + $area_3$
= 2(2 x 0.75 ÷ 2) + (1.25 x 3) + (1.25 x 3) + (3 x 2)
= 1.5 + 3.75 + 3.75 + 6
= $15m^2$

$SA_{rec\ pr}$ = 2(top) + 2(front) + 2(side)
= 2(3 x 2) + 2(3 x 2) + 2(2 x 2)
= 12 + 12 + 8
= $32m^2$

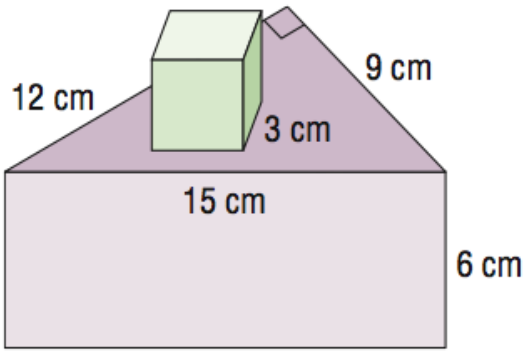
$SA_{overlap}$ = 2(3 x 2)
= $12m^2$

TSA = SA_{roof} + $SA_{rect\ pr}$ - $SA_{overlap}$
= 15 + 32 - 12
= $35m^2$

Questions page 40 - #3(d) & (e), 8

Page 40 #3

d) cube on a triangular prism



$SA_{tr\ pr}$ = 2(area of base) + area of 3 rect faces
= 2(12 x 9 ÷ 2) + (15 x 6) + (12 x 6) + (9 x 6)
= 108 + 90 + 72 + 54
= $324cm^2$

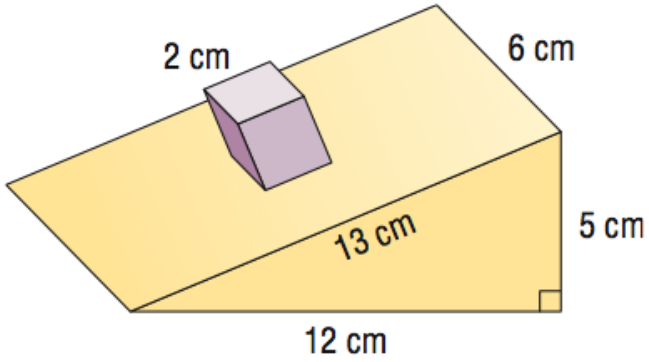
SA_{cube} = 2(top) + 2(front) + 2(side)
= 2(3 x 3) + 2(3 x 3) + 2(3 x 3) or 6(3 x 3)
= 18 + 18 + 18
= $54cm^2$

$SA_{overlap}$ = 2(3 x 3)
= $18cm^2$

TSA = $SA_{tri\ pr}$ + SA_{cube} - $SA_{overlap}$
= 324 + 54 - 18
= $360cm^2$

Page 40 #3

e) cube on a triangular prism



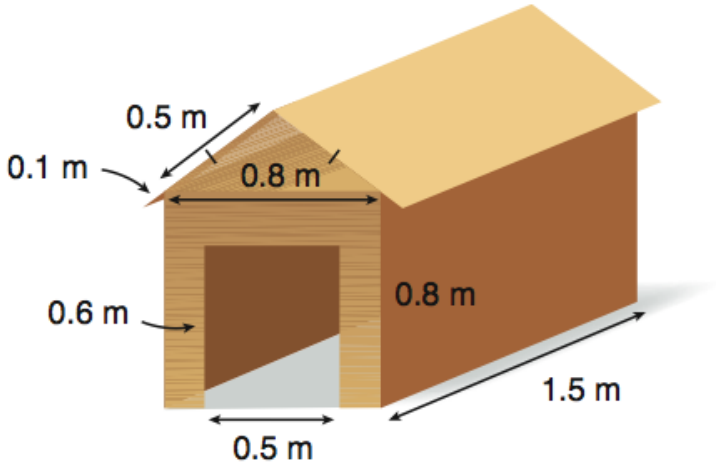
$SA_{tri\ pr}$ = 2(area base) + 3 rect faces
= 2(12 x 5 ÷ 2) + (13 x 6) + (12 x 6) + (6 x 5)
= 60 + 78 + 72 + 30
= $240cm^2$

SA_{cube} = 6(2 x 2)
= $24cm^2$

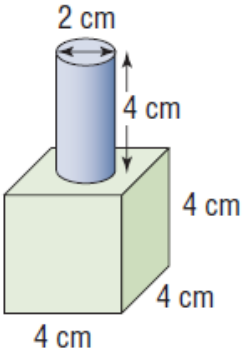
$SA_{overlap}$ = 2(2 x 2)
= $8cm^2$

TSA = $SA_{tri\ pr} + SA_{cube} - SA_{overlap}$
= 240 + 24 - 8
= $256cm^2$

Page 41 #8



Page 40...# 3(a)



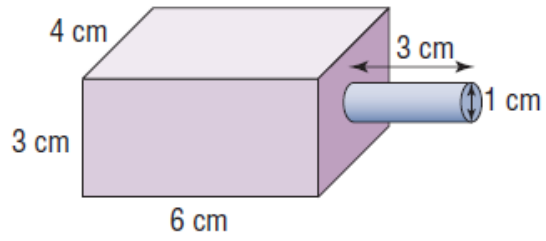
SA_{cube} = $6(4 \times 4)$
= $6(16)$
= $96cm^2$

SA_{cyl} = $2\pi r^2 + 2\pi rh$
= $(2)(3.14)(1)^2 + (2)(3.14)(1)(4)$
= $6.28 + 25.12$
= $31.4cm^2$

$SA_{overlap}$ = $2\pi r^2$
= $(2)(3.14)(1)^2$
= $6.28cm^2$

TSA = $SA_{cube} + SA_{cyl} - SA_{overlap}$
= $96 + 31.4 - 6.28$
= $121.12cm^2$
= $121cm^2$

Page 40...# 3(b)



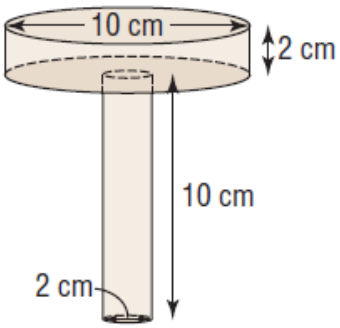
SA_{rect} = $2_f + 2_t + 2_s$
= $2(6 \times 3) + 2(6 \times 4) + 2(3 \times 4)$
= $36 + 48 + 24$
= $108cm^2$

SA_{cyl} = $2\pi r^2 + 2\pi rh$
= $(2)(3.14)(0.5)^2 + (2)(3.14)(0.5)(3)$
= $1.57 + 9.42$
= $10.99cm^2$

SA_{ov} = $2\pi r^2$
= $(2)(3.14)(0.5)^2$
= $1.57cm^2$

TSA = $SA_{rect} + SA_{cyl} - SA_{ov}$
= $108 + 10.99 - 1.57$
= $117.42cm^2$
= $117cm^2$

Page 40...# 3(c)



SA_{cyl1} = $2\pi r^2 + 2\pi rh$
= $(2)(3.14)(5)^2 + (2)(3.14)(5)(2)$
= $157 + 62.8$
= $219.8cm^2$

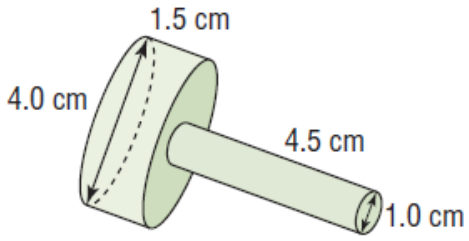
SA_{cyl2} = $2\pi r^2 + 2\pi rh$
= $(2)(3.14)(1)^2 + (2)(3.14)(1)(10)$
= $6.28 + 62.8$
= $69.08cm^2$

SA_{ov} = $2\pi r^2$
= $(2)(3.14)(1)^2$
= $6.28cm^2$

TSA = $SA_{cyl1} + SA_{cyl2} - SA_{ov}$
= $219.8 + 69.08 - 6.28$
= $282.6cm^2$
= $283cm^2$

Page 40...# 4

a)



SA_{cyl1} = $2\pi r^2 + 2\pi rh$
= $(2)(3.14)(2)^2 + (2)(3.14)(2)(1.5)$
= $25.12 + 18.84$
= $43.96cm^2$

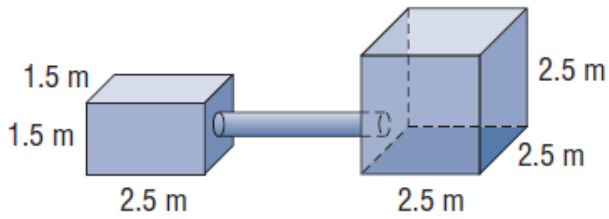
SA_{cyl2} = $2\pi r^2 + 2\pi rh$
= $(2)(3.14)(0.5)^2 + (2)(3.14)(0.5)(4.5)$
= $1.57 + 14.13$
= $15.7cm^2$

SA_{ov} = $2\pi r^2$
= $(2)(3.14)(0.5)^2$
= $1.57cm^2$

TSA = $SA_{cyl1} + SA_{cyl2} - SA_{ov}$
= $43.96 + 15.7 - 1.57$
= $58.09cm^2$
= $58.1cm^2$

Page 40...#4

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



SA_{cube} = 6(2.5 x 2.5)
= $37.5m^2$

SA_{rect} = $2_f + 2_t + 2_s$
= 2(2.5 x 1.5) + 2(2.5 x 1.5) + 2(1.5 x 1.5)
= 7.5 + 7.5 + 4.5
= $19.5m^2$

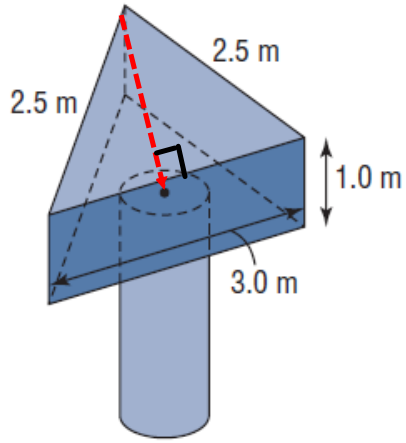
SA_{cyl} = $2\pi r^2 + 2\pi rh$
= $(2)(3.14)(0.25)^2 + (2)(3.14)(0.25)(3.5)$
= 0.3925 + 5.495
= $5.8875m^2$ ---►

SA_{ov} = $4\pi r^2$ (4 overlaps)
= $(4)(3.14)(0.25)^2$
= $0.785m^2$

TSA = $SA_{cube} + SA_{rect} + SA_{cyl} - SA_{ov}$
= 37.5 + 19.5 + 5.8875 - 0.785
= $62.1025m^2$
= $62.1m^2$

Page 40...#5

a) The cylinder is 2.5 m long with radius 0.5 m.



**Need to find the height of the triangle first

$c^2 - b^2 = a^2$
$2.5^2 - 1.5^2 = a^2$
$6.25 - 2.25 = a^2$
$4 = a^2$
$\sqrt{4} = a$
$a = 2$ The height = 2m

$SA_{tri} = 2(b \times h \div 2)$
$= 2(3 \times 2 \div 2)$
$= 6m^2$

$SA_{base1} = (3)(1)$
$= 3m^2$

$SA_{base2} = (2.5)(1)$
$= 2.5m^2$

$SA_{base3} = (2.5)(1)$
$= 2.5m^2$

$TSA_{tri\ prism} = SA_{tri} + SA_{base1} + SA_{base2} + SA_{base3}$
$= 6 + 3 + 2.5 + 2.5$
$= 14m^2$

$SA_{cyl} = 2\pi r^2 + 2\pi rh$
$= (2)(3.14)(0.5)^2 + 2(3.14)(0.5)(2.5)$
$= 1.57 + 7.85$
$= 9.42m^2$

$SA_{ov} = 2\pi r^2$
$= (2)(3.14)(0.5)^2$
$= 1.57m^2$

$TSA = SA_{tri\ prism} + SA_{cyl} - SA_{ov}$
$= 14 + 9.42 - 1.57$
$= 21.85m^2$