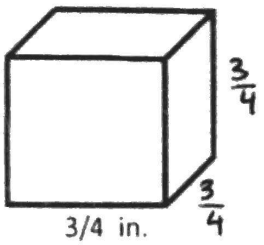
Math 6 Unit 5: Area and Volume Study Guide Name -KEY- Per.____

1. Determine the VOLUME and the SURFACE AREA of the cube pictured at right.



$V = Lwh$

$\frac{3}{4} \cdot \frac{3}{4} \cdot \frac{3}{4} = \frac{27}{64}$

$V = \frac{27}{64} in^3$

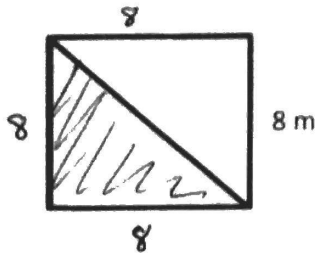
SA:

Area of one face

$\frac{3}{4} \cdot \frac{3}{4} = \frac{9}{16}$

Six faces $\frac{9}{16} \cdot 6 = \frac{54}{16}$ OR $\frac{27}{8}$ OR $3\frac{3}{8}$ in^2

2. Find the area of the shaded section of the square below.



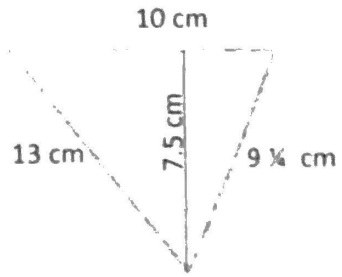
$A = \frac{1}{2}bh$

$\frac{1}{2}(8)(8)$

$4(8)$

$A = 32 m^2$

3. Find the area of the triangle pictured below.



$A = \frac{1}{2}bh$

$\frac{1}{2}(10)(7.5)$

$5(7.5)$

$A = 37.5$ OR $37\frac{1}{2} cm^2$

4. The dimensions for two boxes ae shown in the table.

Box A

$V = Lwh$

$(8.5)(2)(4.8)$

$81.6 u^3$

Dimensions	Box A	Box B
Height	8.5	10
Width	2	1.8
Length	4.8	5

Box B

$V = lwh$

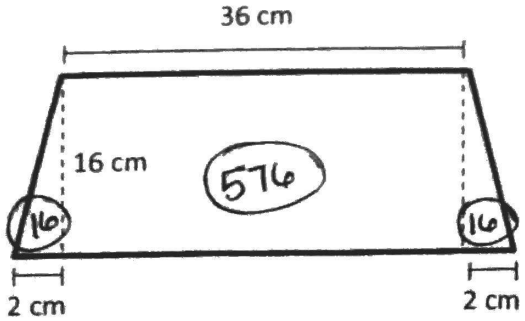
$(10)(1.8)(5)$

$90 u^3$

Which box has a greater volume? Box B By how much? $8.4 u^3$

$90.0 - 81.6 = 8.4$

5. Determine the area of the trapezoid.



Rectangle

$A = bh$

$36 \cdot 16$

$576 cm^2$

Triangles

$A = \frac{1}{2}bh$

$\frac{1}{2}(2)(16)$

$2(8)$

$16 cm^2$

$576 + 16 + 16 = 608$

$A = 608 cm^2$

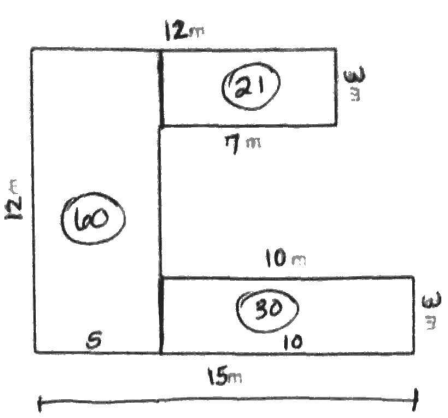
6. Find the area of the composite figure shown below.

A = bh
12 · 5
60

A = bh
7 · 3
21

A = bh
10 · 3
30

60
+21
30
121



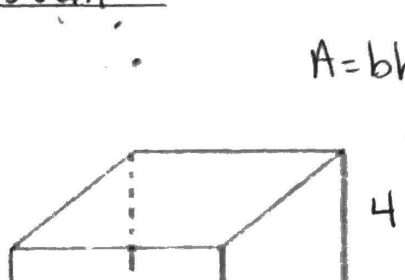
A = 111 sq. m

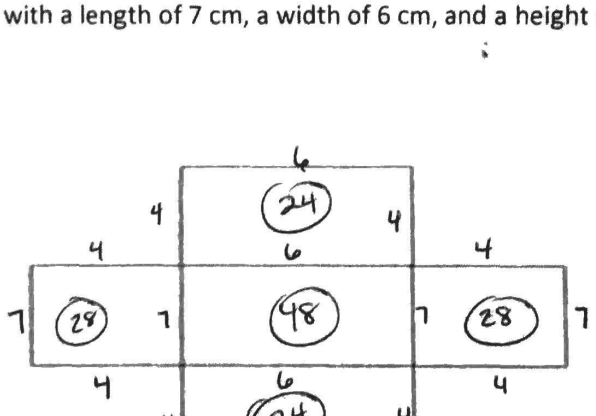
7. What is the difference between AREA and SURFACE AREA?
Area - covers the surface of a 2D figure - units²
SA - covers ALL the surfaces/ faces of a 3D figure - units²

8. What is the difference between SURFACE AREA and VOLUME?
SA - see question #7
V - fills the inside of a 3D figure - units³

9. Determine the surface area of a rectangular prism with a length of 7 cm, a width of 6 cm, and a height of 4 cm.
SA = 188 cm²

A = bh





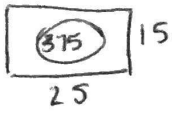
Congruent < TOP 42 (7×6)
B 42

Congruent < FRONT 28 (7×4)
BK 28

Congruent < S1 24 (6×4)
S2 24

42
+42
28
28
24
24
188

10. If sod grass can be purchased at $0.50 per square foot, how much would it cost to put sod in a backyard shaped like a rectangle that is 15 feet wide and 25 feet long?



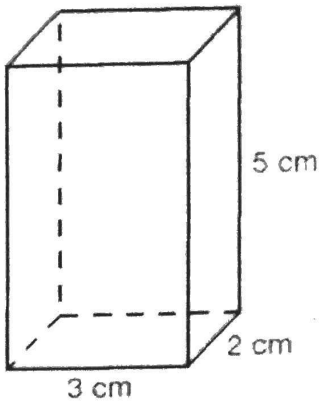
$A=bh$
$(25)(15)$
$375\ ft^2$

Will need 375 50¢s

$$375 \times .50 = 187.5$$

$187.50

11. How many square centimeters of wrapping paper are needed to cover the surface area of the box shown to the right?

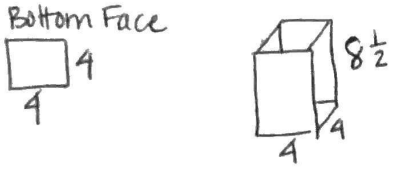


$A=bh$ for each face

TOP 6 (3×2)
B 6
F 15
BK 15 (3×5) > Congruent
S1 10 (2×5)
S2 10 > Congruent

$SA = 62\ cm^2$

12. The volume of a rectangular prism can be found by using the formula $V = Bh$, where B is the area of the base. If the base of a prism is square with a side length of 4 inches and the height of the prism is $8\frac{1}{2}$ inches, find the volume of the prism.



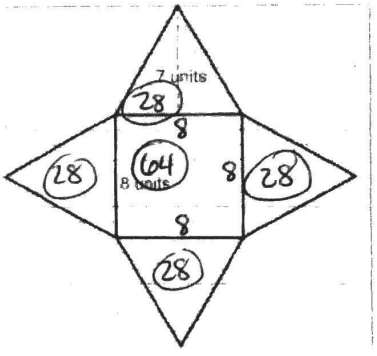
$V = 136\ in^3$

$V = Bh$
$16 \cdot 8\frac{1}{2}$
$\frac{16}{1} \cdot \frac{17}{2} = \frac{272}{2} = 136$

OR

$V = lwh$
$4 \cdot 4 \cdot 8\frac{1}{2}$
$\frac{4}{1} \cdot \frac{4}{1} \cdot \frac{17}{2} = \frac{272}{2}$
$= 136$

13. What is the surface area of the square pyramid shown? $SA = 176u^2$



$A=bh$
$8 \cdot 8$
64

$A = \frac{1}{2}bh$
$\frac{1}{2}(8)(7)$
$4(7)$
28

all triangle are congruent b/c the base is a sq.

$28 \times 4 = 112$

$112 + 64 = 176$

14. A rectangular prism is filled with small cubes of the same size. The bottom layer consists of 6 cubes, each with a volume of 1 cubic cm. If there are 3 layers of cubes in the prism, what is the volume of the rectangular prism?

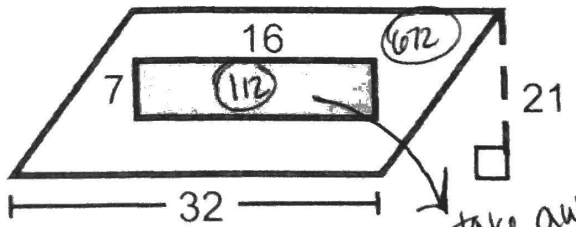
Volume = $18u^3$

Bottom layer = Big B
$B = 6$
Layers = height
$h = 3$

$V = Bh$
$6 \cdot 3$
18

15 Find the area of the non-shaded region.

$A = 560 u^2$



take away/out

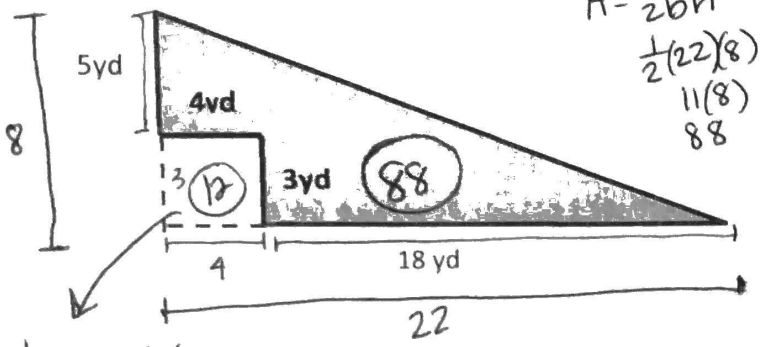
672
-112
560

Parallelogram
A=bh
32·21
672

Rec
A=bh
16·7
112

16. Find the area of the shaded pentagon.

$A = 76 yd^2$



take out/away

Triangle (including the square's area)
$A = \frac{1}{2}bh$
$\frac{1}{2}(22)(8)$
11(8)
88

Squares A=bh
9·3
12

88
-12
76

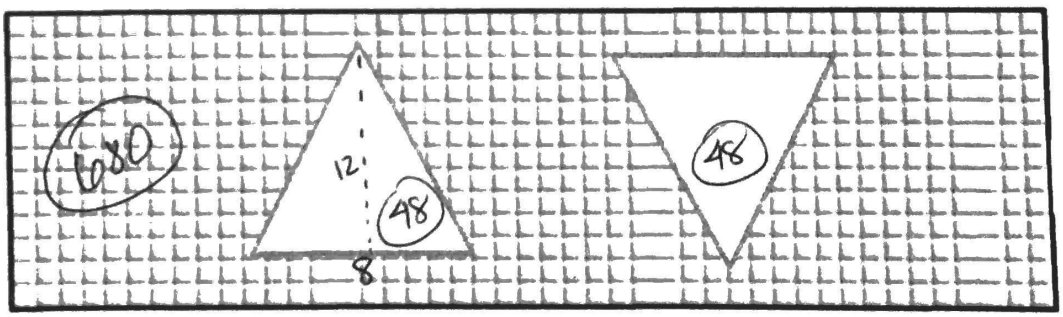
17. Mary wants to carpet a portion of her rectangular room. She wants to leave the two congruent triangles bare wood without carpet. Each of the triangles has a base of 8 feet and a height of 12 feet. What is the area of the carpeted flooring she will need?

Area = 584 ft²

→ triangles are congruent

carpeted → shaded region

40 feet



17 feet

take away triangle
680
-96
584

Both Δ
48
+48
96

Rec
A=bh
40·17
680

tri
$A = \frac{1}{2}bh$
$\frac{1}{2}(8)(12)$
8(6)
48