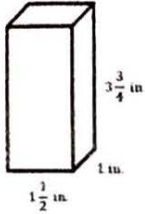# Geometry Unit B Part 2: Volume and Surface Area Study Guide

Part 1: Volume

Formula for Area of a Rectangle: $A = bh$ Formula for Area of a Triangle: $A = \frac{1}{2}bh$

Formula for Volume: $(\text{Area of Base})(\text{height})$

1. Find the Volume of the rectangular prism. (Hint: to multiply fractions, convert to an improper fraction or to a decimal.)

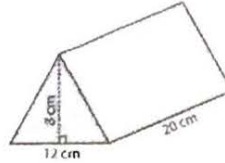$1\frac{1}{2} = \frac{3}{2} = 1.5$

$3\frac{3}{4} = \frac{15}{4} = 3.75$

$1.5 \times 3.75 \times 1 = 5.625 \text{ in}^3$

OR

$\frac{3}{2} \times \frac{15}{4} \times \frac{1}{1} = \frac{45}{8} = 5\frac{5}{8} \text{ in}^3$
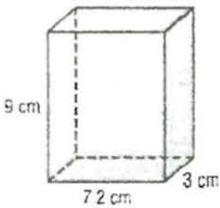
V = _____

3. Find the Volume of the triangular prism.

$\triangle = \frac{1}{2}(12)(8)$
$= 48 \text{ cm}^2$

$48 \times 20 = 960$

V = 960 cm^3

2. Find the Volume of the rectangular prism. (Hint: to multiply fractions, convert to an improper fraction or to a decimal.)
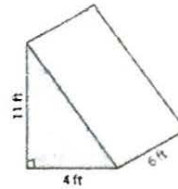
$9 \times 7.2 \times 3 =$

194.4

V = 194.4 cm^3

4. Find the Volume of the triangular prism.

$\triangle = \frac{1}{2}(4)(11)$
$= 22 \text{ ft}^2$

$22 \times 6 = 132$

V = 132 ft^3

5. A toy company makes rectangular sandboxes that measure 6 feet by 5 feet by 1.2 feet. A customer buys a sandbox and 40 cubic feet of sand. Did the customer buy too much or too little sand? Justify your answer.
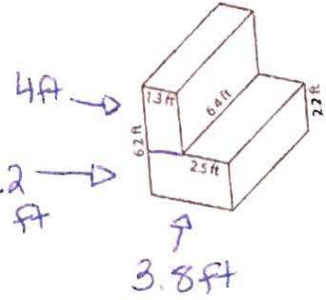
Volume

$6 \text{ ft} \times 5 \text{ ft} \times 1.2 \text{ ft}$

$= 36 \text{ ft}^3$

40 ft^3 of sand is too much for a sandbox that has a volume of 36 ft^3

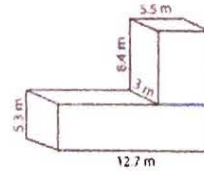6. Find the volume of the composite figures. Round to the hundredths place if necessary.

4ft →
1.3 ft   6.4 ft   2.2 ft
6.2 ft   2.5 ft
..2 → ft
3.8ft

Top Prism:
$1.3 \times 4 \times 6.4 =$
$33.28 \, ft^3$

Bottom Prism:
$3.8 \times 6.4 \times 2.2 =$
$53.50 \, ft^3$

V = $\underline{53.50 + 33.28 =}$
$\boxed{86.78 \, ft^3}$

7. Find the volume of the composite figures. Round to the hundredths place if necessary.
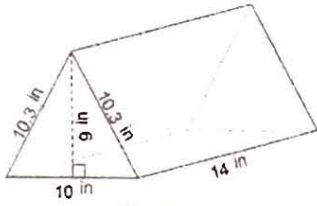
5.5 m
8.4 m   3 m
5.3 m
12.7 m

Top Prism:
$5.5 \times 8.4 \times 3 =$
$138.6 \, m^3$

Bottom Prism:
$12.7 \times 5.3 \times 3 =$
$201.93 \, m^3$

V = $\underline{138.6 + 201.93 =}$
$\boxed{340.53 \, m^3}$

Part 2: Surface Area

8. Complete the F-A-T table to calculate the surface area of each geometric solid. Show all work. Include labels with your answers.
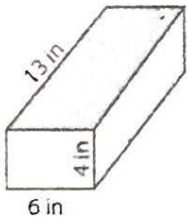
10.3 in   10.3 in   9 in   14 in   10 in

$90 + 140 + 288.4$

SA = $\boxed{518.4 \, in^2}$

Faces	Area	Total
Bases (Front & Back)	$\frac{1}{2}(10)(9) =$ $45 \, in^2$	$45 \times 2 = 90 \, in^2$
Bottom	$(10)(14) = 140 \, in^2$	$140 \, in^2$
Sides	$(10.3)(14) =$ $144.2 \, in^2$	$144.2 \times 2 =$ $288.4 \, in^2$

9. Complete the F-A-T table to calculate the surface area of each geometric solid. Show all work. Include labels with your answers.

13 in   4 in   6 in

$48 + 156 + 104 =$

SA = $\boxed{308 \, in^2}$

Faces	Area	Total
Front & Back	$(6)(4) = 24$	$24 \times 2 = 48 \, in^2$
Top & Bottom	$(13)(6) = 78$	$78 \times 2 = 156 \, in^2$
Sides	$(4)(13) = 52$	$52 \times 2 = 104 \, in^2$

10. Complete the F-A-T table to calculate the surface area of each geometric solid. Show all work. Include labels with your answers.
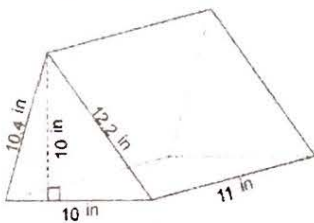
10.4 in   10 in   12.2 in   11 in   10 in

$100 + 110 + 114.4 +$
$134.2 =$

SA = $\boxed{458.6 \, in^2}$

Faces	Area	Total
Bases (Front & Back) △s	$\frac{1}{2}(10)(10) =$ $50 \, in^2$	$50 \times 2 = 100 \, in^2$
Bottom	$(10)(11) =$ $110 \, in^2$	$110 \, in^2$
Sides	$(10.4)(11) = → 114.4 \, in^2$ $(12.2)(11) = → 134.2 \, in^2$	