

HW 9.2 SOL

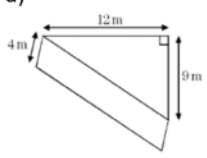
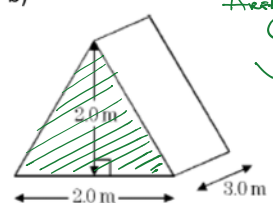
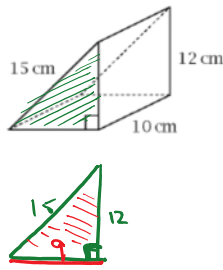
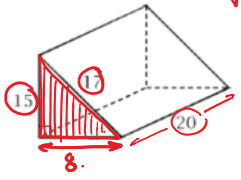
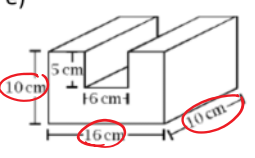
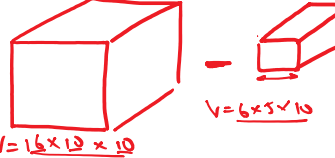
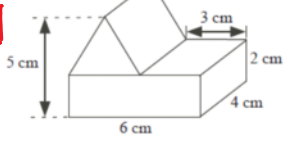
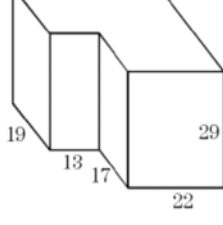
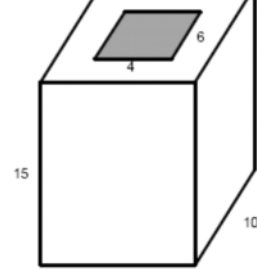
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HW Math 8 Section 9.2 Volume of Rectangular and Triangular Prisms

1. Given each prism, find the volume:

<p>a)</p>  $\begin{aligned} \text{Vol} &= \left(\frac{12 \times 9}{2}\right) \times 4 \\ &= (6 \times 9) \times 4 \\ &= 54 \times 4 \\ &= 216 \text{ m}^3 \end{aligned}$	<p>b)</p>  $\begin{aligned} \text{Area of Base} &= \frac{2 \times 2}{2} = 2 \text{ m}^2 \\ \text{(triangle)} \\ \text{Vol} &= (\text{A. of B.}) \times \text{HEIGHT} \\ &= 2 \text{ m}^2 \times 3 \text{ m} \\ &= 6 \text{ m}^3 \end{aligned}$
<p>c)</p>  $\begin{aligned} \text{Area of Base} &= \frac{9 \times 12}{2} = 54 \text{ cm}^2 \\ \text{Vol} &= (\text{A. of B.}) \times \text{HEIGHT} \\ &= 54 \times 10 \\ &= 540 \text{ cm}^3 \end{aligned}$	<p>d)</p>  $\begin{aligned} \text{Vol} &= (\text{Area of Base}) \times (\text{Height of Prism}) \\ &= \left(\frac{8 \times 15}{2}\right) \times 20 \\ &= 120 \times 10 \\ &= 1200 \text{ units}^3 \end{aligned}$
<p>e)</p>   $\begin{aligned} V &= 6 \times 5 \times 10 \\ \text{Vol} &= 16 \times 10 \times 10 \\ \text{Vol} &= 1600 - 300 = 1300 \text{ cm}^3 \end{aligned}$	
 $\begin{aligned} \text{Vol} &= (29)(35)(36) \\ \text{Box} &= 36,540 \\ \text{Vol} &= (29)(13)(17) \\ \text{Shall} &= 6,409 \\ \text{Vol Prism} &= 36,540 - 6,409 \\ &= 30,131 \text{ units}^3 \end{aligned}$	

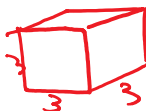
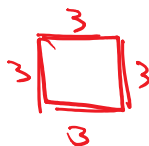
2. If the volume of a cube is $N \text{ cm}^3$ and the surface area is $N \text{ cm}^2$, then what is the value of " N "?



$$\begin{aligned} \text{Vol} &= 6 \times 6 \times 6 \\ &= 216 \end{aligned}$$

$$\begin{aligned} \text{SA} &= 6 \times 6 \times 6 \\ &= 216 \end{aligned}$$

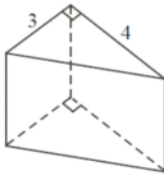
3. If each face of a cube has a perimeter of 12 centimeters, what is the volume of the cube, in cubic centimeters?



$$\begin{aligned} V &= 3 \times 3 \times 3 \\ &= 27 \text{ cm}^3 \end{aligned}$$

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4. A triangular prism has a volume of 120cm^3 . Two edges of the triangular faces measures 3cm and 4cm as shown. What is the height of the prism?



① Area of Base
 $= \frac{3 \times 4}{2} = 6 \text{ units}^2$

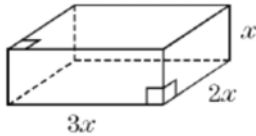
② Vol = (Area of Base) \times Height

$$120 = 6 \times H$$

$$120 = 6 \times 20$$

$$\therefore \boxed{H = 20 \text{ units}}$$

5. If the volume of the box below is 162cm^3 , then what is the value of "x"?



$l = 3x$
 $w = 2x$
 $h = x$

Vol = $(3x)(2x)(x) = 162 \text{ cm}^3$

$$6 \cdot x \cdot x \cdot x = 162$$

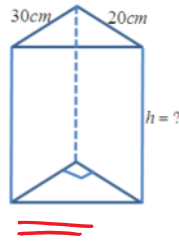
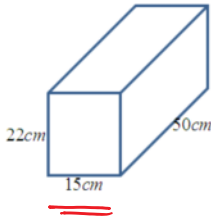
$$6 \times 27 = 162$$

$$x \cdot x \cdot x = 27$$

$$\boxed{x = 3}$$

$162 \div 6 = 27$

6. If the two shapes have the same volume, then what is the height of the 2nd prism?



Prism
 $V = 22 \times 15 \times 30 = 6500 \text{ cm}^3$

$$V = \frac{30 \times 20 \times h}{2} = 300 \times h$$

$$300 \times 55 = 16500$$

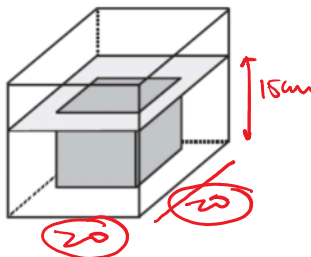
$$300 \times h = 16500$$

$$\boxed{h = 55}$$

7. A water tank in the shape of a rectangular prism [20cm wide, 85cm long, and 55cm high] is 75% filled with water. What is the depth of the water? If a solid block measuring 20cm by 20cm by 20cm is placed inside this tank, what will the depth of the water be then?

8. A container in the shape of a cube has edge length 20cm and contains some water. A solid gold cube, with edge length 15cm, sinks to the bottom of this container, causing the water level to rise just to the top of the solid cube. Which of the following is closest to the original depth of the water?

- A) 6.56 B) 8.25 C) 10.50 D) 5.31 E) 7.50



Total vol = $20 \times 20 \times 15 = 6000$ = Gold + water.

$$= 15 \times 15 \times 15 + 20 \times 20 \times h$$

$$6000 = 3375 + 400 \times h$$

$$\rightarrow 2625 = 400 \times h$$

water only

$$\frac{2625}{400} = h = 6.5625$$

By Simon Conway.

1. a)



$$12 \times 9 \div 2 = 54 \text{ m}^2$$

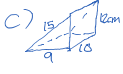
$$\times \frac{4}{216 \text{ m}^3}$$

b)



$$2 \times 2 \div 2 = 2 \text{ m}^2$$

$$\times \frac{3}{6 \text{ m}^3}$$



$$c^2 - b^2 = a^2$$

$$15^2 - 12^2 = a^2$$

$$225 - 144 = a^2$$

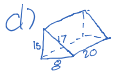
$$81 = a^2$$

$$a = \sqrt{81} / 9$$

$$9 \times 12 \div 2 = 54 \text{ cm}^2$$

$$\times 10$$

$$\underline{540 \text{ cm}^3}$$



$$c^2 - a^2 = b^2$$

$$17^2 - 15^2 = b^2$$

$$289 - 225 = b^2$$

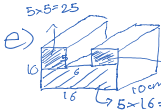
$$64 = b^2$$

$$b = \sqrt{64} / 8$$

$$8 \times 15 \div 2 = 60 \text{ units}^2$$

$$\times 20$$

$$\underline{1200 \text{ units}^3}$$

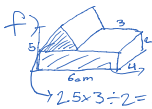


$$5 \times 5 = 25$$

$$25 + 25 + 80 = 130 \text{ cm}^2$$

$$\times 10$$

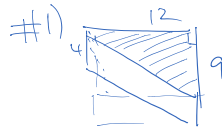
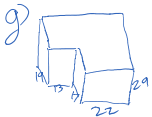
$$\underline{1300 \text{ cm}^3}$$



$$24 \times 3.75 = 27.75 \text{ cm}^2$$

$$\times 4$$

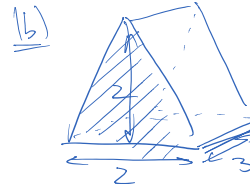
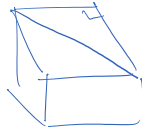
$$\underline{111 \text{ cm}^3}$$



#1) $V = (\text{Area of Base}) \times \text{Height}$

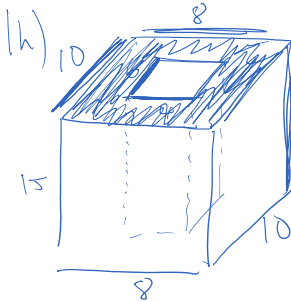
$$V = (12 \times 9) \times 4$$

$$V = 216 \text{ m}^3$$



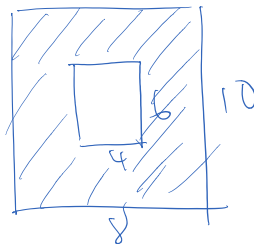
$$V = \left(\frac{2 \times 2}{2}\right) \times 3$$

$$= 6 \text{ m}^3$$



Volume = Volume

$$(10 \times 8 \times 15) - (6 \times 4 \times 15)$$



$$8 \times 10 - 4 \times 6$$

$$80 - 24$$

$$= 56$$

(Area of Base)

#2)



$$V = x^3 \text{ cm}^3$$

$$V = (x)(x)(x)$$

$$V = 216 = N$$

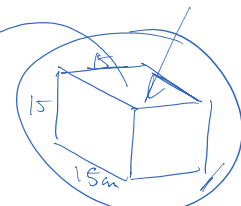
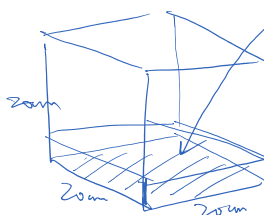


$$S.A. = 6x^2 \text{ cm}^2$$

$$S.A. = (x)(x)6$$

$$S.A. = 216 = N$$

8)



$$V = 15 \times 15 \times 15$$

3, ., 3,



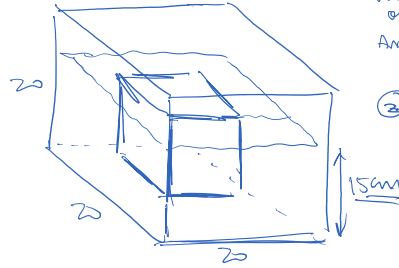
$$V = 15 \times 15 \times 15$$

$$\sqrt[3]{\frac{15 \times 15 \times 15}{20 \times 20}} = \text{Height } h$$

$$\begin{array}{r} 15 \\ 9 \\ \hline 90 \\ 45 \\ \hline 135 \end{array}$$

$$\frac{135}{16} = H$$

8)



$$\textcircled{1} (20 \times 20 \times 15) - (15 \times 15 \times 15) = 2,625$$

Volume of water AND cube Vol. of GOLDEN cube Vol. of WATER

$$\textcircled{2} V = l \times w \times h$$

$$2,625 = 20 \times 20 \times H$$

$$6.5625 = H$$