Last class continued

Similar Figures:

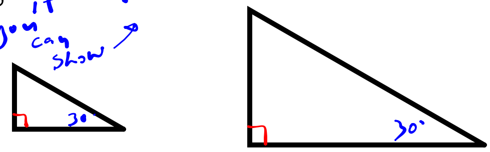
The ratio of the volumes of similar figure is equal to the cube of k.

Th 50 d) $\frac{V_1}{V_2} = k^3$

There are 3 ways to show the triangles are:

Congruent	Similar
SSS	Th 18 if AA ≅ AA you can show → then you say the triangles are similar
SAS	Th 19 $\frac{S_{Big}}{S_{small}} = \frac{S_{Big}}{S_{small}} = \frac{S_{Big}}{S_{small}}$
ASA	Th 20 $\frac{S_{Big}}{S_{small}} = \frac{S_{Big}}{S_{small}}$ A ≅ A (contained angle)

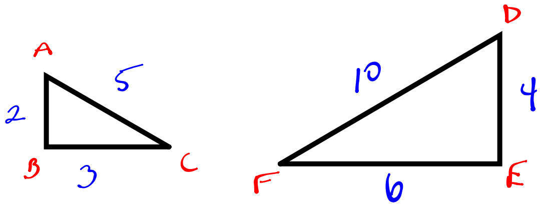
Th 18 if AA ≅ AA
you can show ↗



then you say the triangles are similar

Th 19

$$\frac{S_{Big}}{S_{small}} = \frac{S_{Big}}{S_{small}} = \frac{S_{Big}}{S_{small}}$$



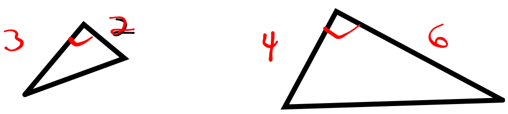
$$\frac{4}{2} = \frac{6}{3} = \frac{10}{5} = 2$$

↳ you can say the Δ's are similar!

Th 20

$$\frac{S_{Big}}{S_{small}} = \frac{S_{Big}}{S_{small}} \qquad A \cong A$$

(contained angle)



$$\frac{4}{2} = \frac{6}{3} = 2 \qquad 90° = 90° \quad \text{similar!}$$

Unit 11: Equivalent Figures (2D)

Equivalent Solids (3D)

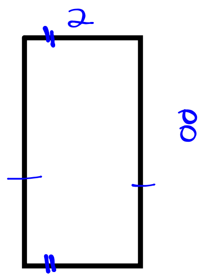
Equivalent Figures (2D): they have the same area.

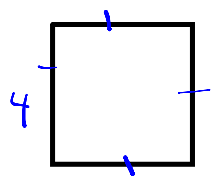
$$A_1 = A_2$$

Ex.

$P = 8 + 8 + 2 + 2$

$P = 20$ units





$P = 4 + 4 + 4 + 4$

$P = 16$ units

$A_{Rect} = l \times w$

$A_1 = 2 \times 8$

$A_1 = 16 \text{ units}^2$

$A_{Sq} = s^2$

$A_2 = 4^2$

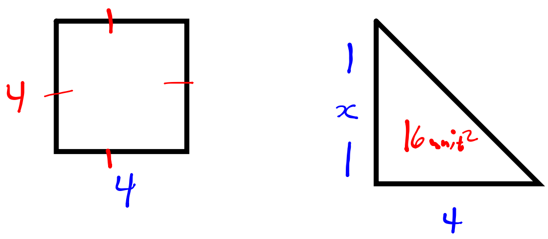
$A_2 = 16 \text{ units}^2$

the same

The two figures are equivalent.

Find x.

$A_1 = A_2$



$A_{sq} = s^2$

$= 4^2$

$A_{sq} = 16$ units

$A_{Tri} = \frac{b \times h}{2}$

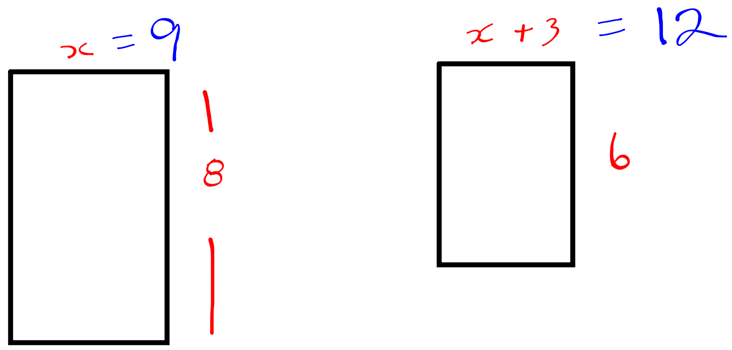
$2 \cdot 16 = \frac{4 \cdot h}{\cancel{2}} \cdot \cancel{2}$

$\frac{32}{4} = \frac{\cancel{4} \cdot h}{\cancel{4}}$

$h = 8$

to solve for h isolate it, by doing the opposite operation to both sides

Shannon made a rectangle sand box. It's length is 8 meters. She then decides to redo the sand box by reducing the length by 2 meters and increasing the width by 3 meters. The two rectangles are equivalent. What are their dimensions?



Simply!
isolate x!

$$A = A$$

$$8 \cdot x = 6(x+3)$$

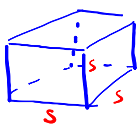
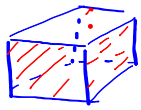
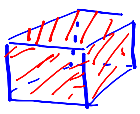
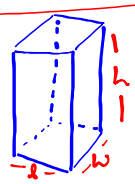
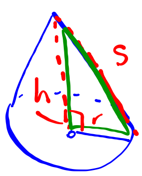
$$8x - 6x = 6x - 6x + 18$$

$$\frac{\cancel{2}x}{\cancel{2}} = \frac{18}{2}$$

$$x = 9$$

Equivalent Solids (3D) have the same volume.

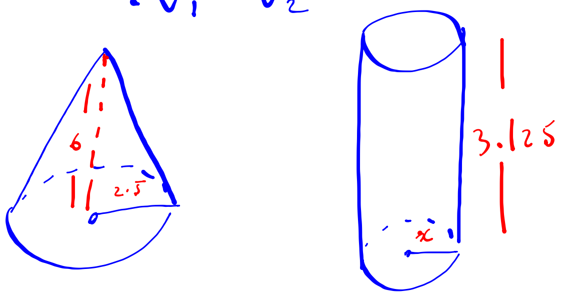
$$V_1 = V_2$$

Recall:		Lateral Area (surface area except base(s))	Total Area (all the surface area)	Volume
Cube:				$V = s^3$ V = (area of base)(height)
Right Prism (Rectangular Prism)		two sides not covered.	everything cover	$V = l \cdot w \cdot h$ V = (area of base) height
Cylinder		toilet pipe	cylinder envelope	$V = \pi r^2 h$ V = (area of base) height
Cone	s - slanted height  $s^2 = r^2 + h^2$	the cookie of the ice cream cone. witch hat	tee pee tent.	$V = \frac{1}{3} \pi r^2 h$

I ♡

ex. The height of a cone is 6 cm and its radius is 2.5 cm. Find the radius of an equivalent cylinder 3.125 cm high.

$V_1 = V_2$



Be cool, fool!

$V_1 = \frac{1}{3}\pi r^2 h$

$V_1 = \frac{1}{3}\pi (2.5)^2 \cdot 6$

$V_1 = 39.27$

$V_2 = \pi r^2 h$

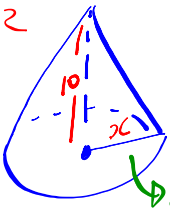
$\frac{39.27}{(\pi \cdot 3.125)} = \frac{\cancel{\pi}\, r^2\, \cancel{3.125}}{\cancel{\pi}\ \cancel{3.125}}$

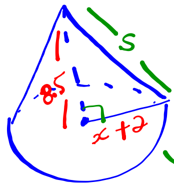
$\sqrt{r^2} = \sqrt{4}$

$r = 2$

Shannon is buying birthday hat with a height of 10 cm. However her head is too big so the hat maker has to increase the radius by 2 cm. The resulting 3D equivalent cone is 1.5 cm shorter. How much material (cm^2) Area is needed to make the final hat?

$V_1 = V_2$





23.626cm

$c^2 = a^2 + b^2$

$\sqrt{s^2} = \sqrt{8.5^2 + 25.626^2}$

$s = 26.999$

25.626

$A = \pi r s$

$A = \pi\, 25.626 \times 26.999$

$$\boxed{A = 2173.59 \text{ cm}^2}$$

$$\cancel{\tfrac{1}{3}}\cancel{\pi}\, x^2 \cdot 10 = \cancel{\tfrac{1}{3}}\cancel{\pi}\,(x+2)^2 \cdot 8.5$$

$$10x^2 = 8.5(x+2)^2$$

$$10x^2 = 8.5(x+2)(x+2)$$

$$10x^2 = 8.5(x^2+2x+2x+4)$$

$$10x^2 = 8.5(x^2+4x+4)$$

$$\cancel{10x^2} - 10x^2 = 8.5x^2 - 10x^2 + 34x + 34$$

$$0 = -1.5x^2 + 34x + 34$$

$a = -1.5$

$b = 34$

$c = 34$

$$\boxed{x = 23.626}$$

To solve for you can't isolate here. It's 2nd degree. Hit it w the quad formula

$0 = ax^2 + bx + c$