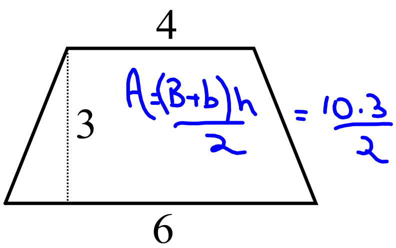
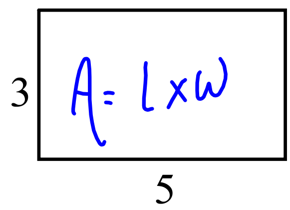
Equivalent Figures

Two plane figures that have the same area, are said to be equivalent.



Area = 15 u^2



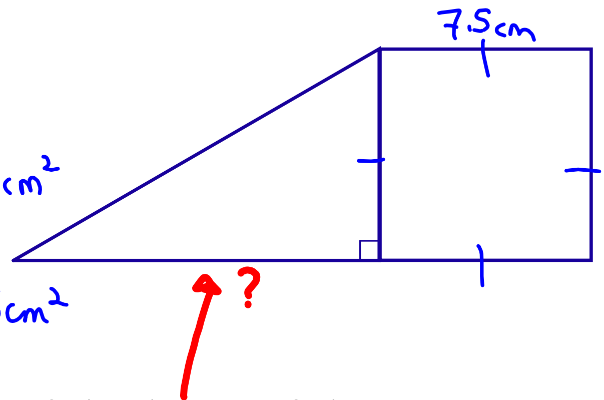
Area = 15 u^2

Example: The square and the triangle are equivalent. What is the area of each figure if the perimeter of the square is $30cm$?

Length of side of the square $= 30 \div 4 = 7.5\text{ cm}$

Area of square $= 7.5^2 = 56.25\text{ cm}^2$

Equivalent $\therefore$ Area of $\Delta = 56.25\text{ cm}^2$



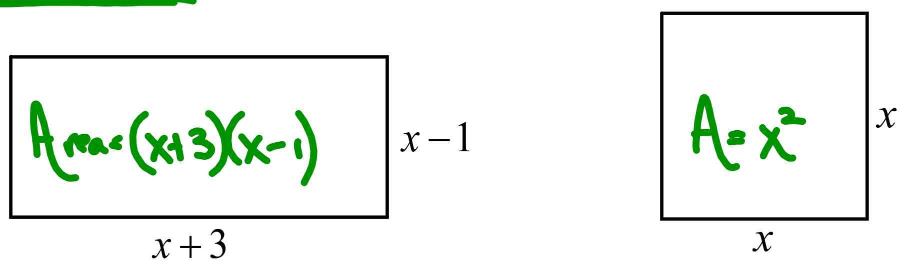
What is the length of the base of the triangle? 15cm

$$56.25 = \frac{b(7.5)}{2}$$

$$112.5 = 7.5b$$

$$15 = b$$

Example: Determine the value of x, if the two figures are equivalent. same area



Equation $(x+3)(x-1) = x^2$

$$\cancel{x^2} + 2x - 3 = \cancel{x^2}$$
$$-\cancel{x^2} \qquad -\cancel{x^2}$$
$$2x - 3 = 0$$
$$+3 \qquad +3$$
$$2x = 3$$
$$\frac{2x}{2} = \frac{3}{2} \Rightarrow x = \frac{3}{2} \text{ or } 1.5$$

check

Rect: $(4.5)(0.5) = 2.25\,u^2$

Square: $(1.5)^2 = 2.25\,u^2$

same area.

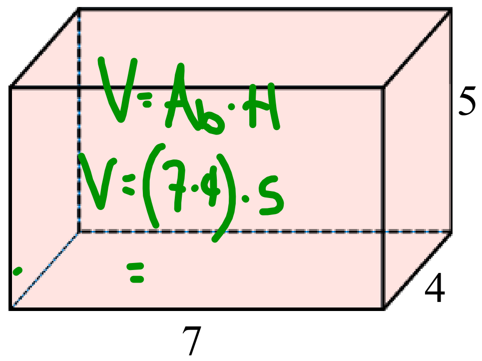
Equivalent Solids

Two solids that have the same volume or capacity, are said to be equivalent.

$V = A_b \cdot H$

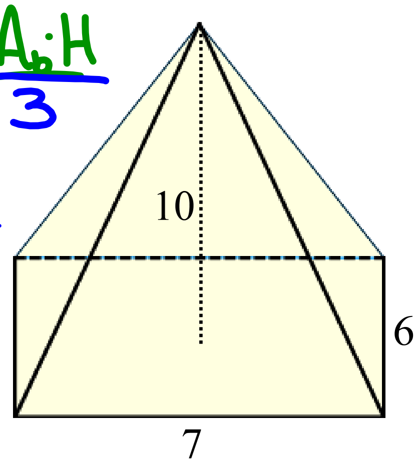
$V = (7 \cdot 4) \cdot 5$

$=$



$V = \frac{A_b \cdot H}{3}$

$V = \frac{(7 \cdot 6) \cdot 10}{3}$



Volume = $140\,u^3$

Volume = $140\,u^3$

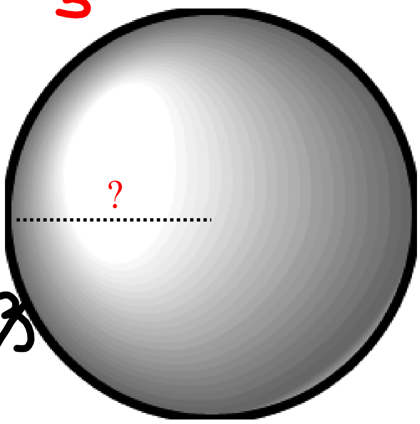
Example: The sphere and the cylinder below are equivalent. Determine the radius of the sphere.

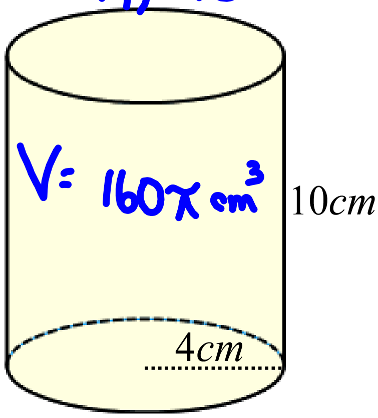
$V = \frac{4\pi r^3}{3}$

$V = \pi r^2 \cdot H$

$= \pi(4)^2 \cdot 10$

$V_s = V_c$





$V = 160\pi \text{ cm}^3$

$160\pi = \frac{4\pi r^3}{3}$

$3 \cdot 160\pi = \frac{4\pi r^3}{\cancel{3}} \cancel{3}$

$\frac{480\cancel{\pi}}{4\cancel{\pi}} = \frac{4\pi r^3}{4\pi}$

$120 = r^3$

$r = \sqrt[3]{120} = \underline{\underline{4.93\text{cm}}}$