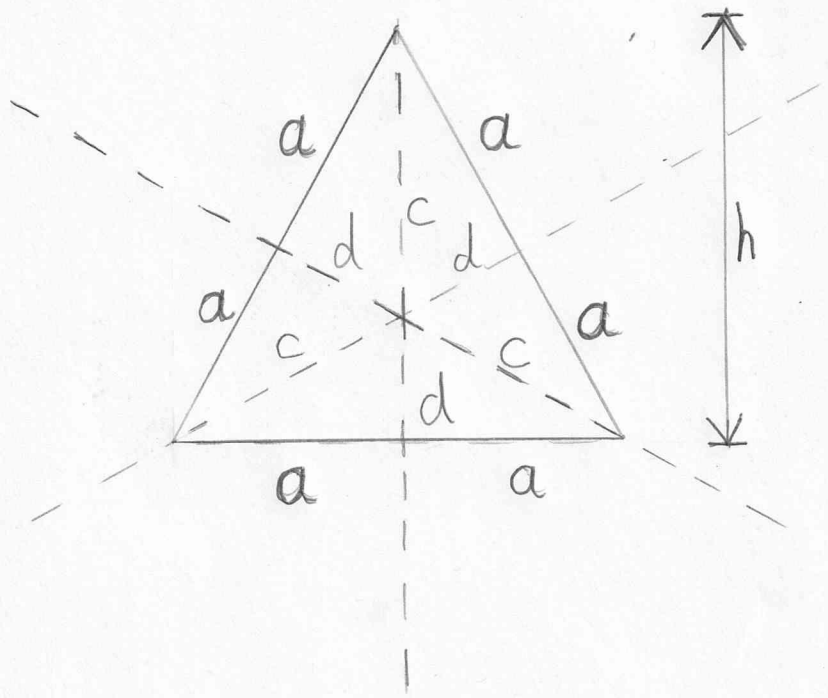
EQUILATERAL TRIANGLE



$$a^2 + h^2 = (2a)^2$$

$$h^2 = (2a)^2 - a^2 = 4a^2 - a^2 = 3a^2$$

$$h = \sqrt{3a^2} = \sqrt{3}\,a$$

$$\boxed{h = \sqrt{3}\,a}$$

$$a^2 + d^2 = c^2$$

$$h = c + d$$

$$c = h - d$$

$$\Rightarrow a^2 + d^2 = (h-d)^2$$

$$a^2 + d^2 = h^2 + d^2 - 2hd$$

$$2hd = h^2 - a^2$$

$$d = \frac{h^2 - a^2}{2h}$$

$$= \frac{(\sqrt{3}\,a)^2 - a^2}{2(\sqrt{3}\,a)}$$

$$= \frac{3a^2 - a^2}{2\sqrt{3}\,a}$$

$$= \frac{2a^2}{2\sqrt{3}\,a}$$

$$= \frac{a}{\sqrt{3}\,a}$$

$$\boxed{d = \frac{a}{\sqrt{3}}}$$

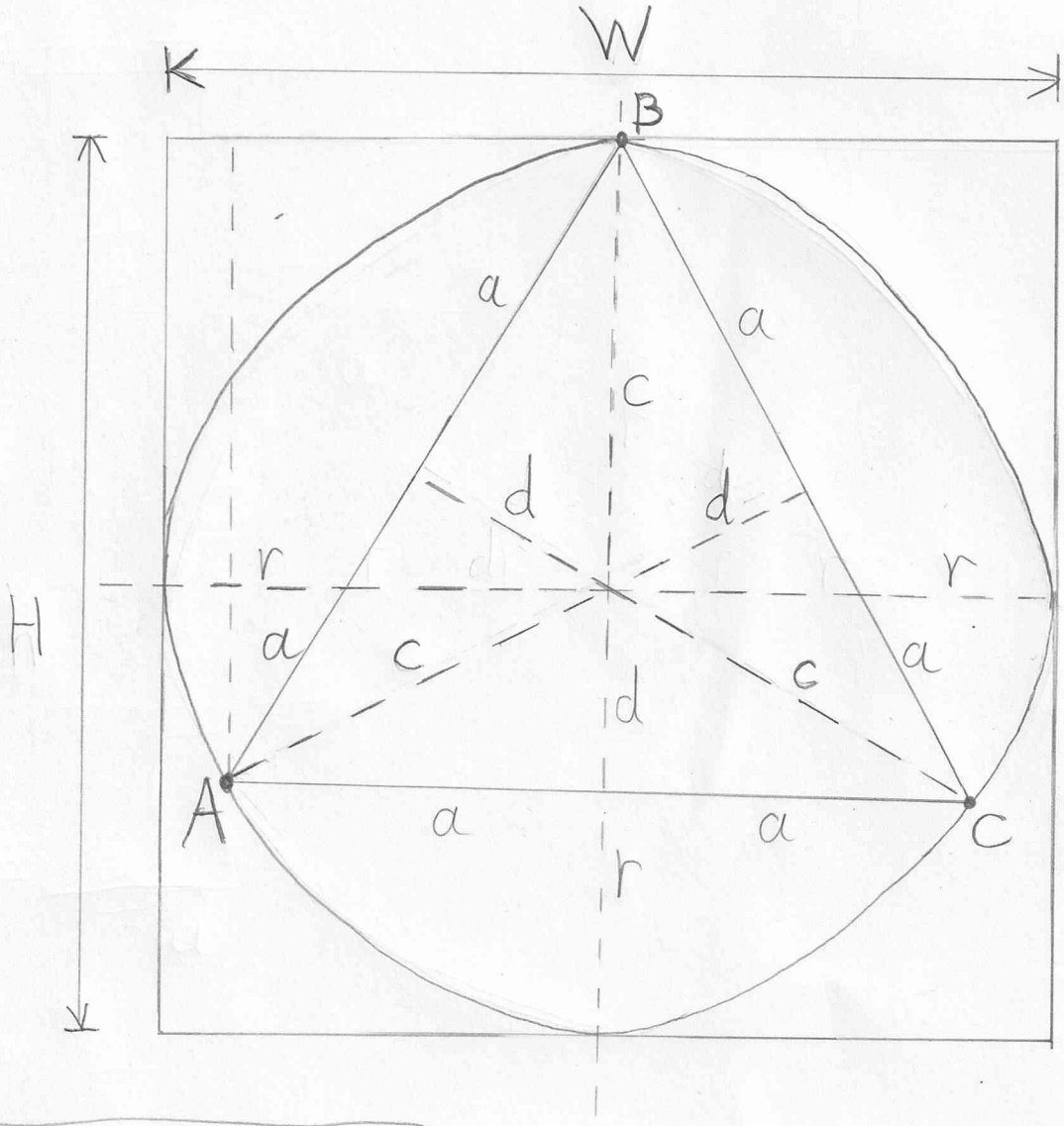
$$c = h - d$$

$$= (\sqrt{3}\,a) - \left(\frac{a}{\sqrt{3}}\right)$$

$$= \frac{3a - a}{\sqrt{3}}$$

$$\boxed{c = \frac{2a}{\sqrt{3}}}$$

EQUILATERAL TRIANGLE INSIDE A



$$r = H/2 = W/2$$

$$d = a/\sqrt{3}$$

$$c = \frac{2a}{\sqrt{3}}$$

$$r = c = H/2$$

$$H/2 = \frac{2a}{\sqrt{3}}$$

$$\frac{H}{4}\sqrt{3} = a$$

$$\boxed{a = \frac{\sqrt{3}}{4}H}$$

length of one side of the triangle $= 2a$

$$= 2\,\frac{\sqrt{3}}{4}H$$

$$= \boxed{\frac{\sqrt{3}}{2}H}$$