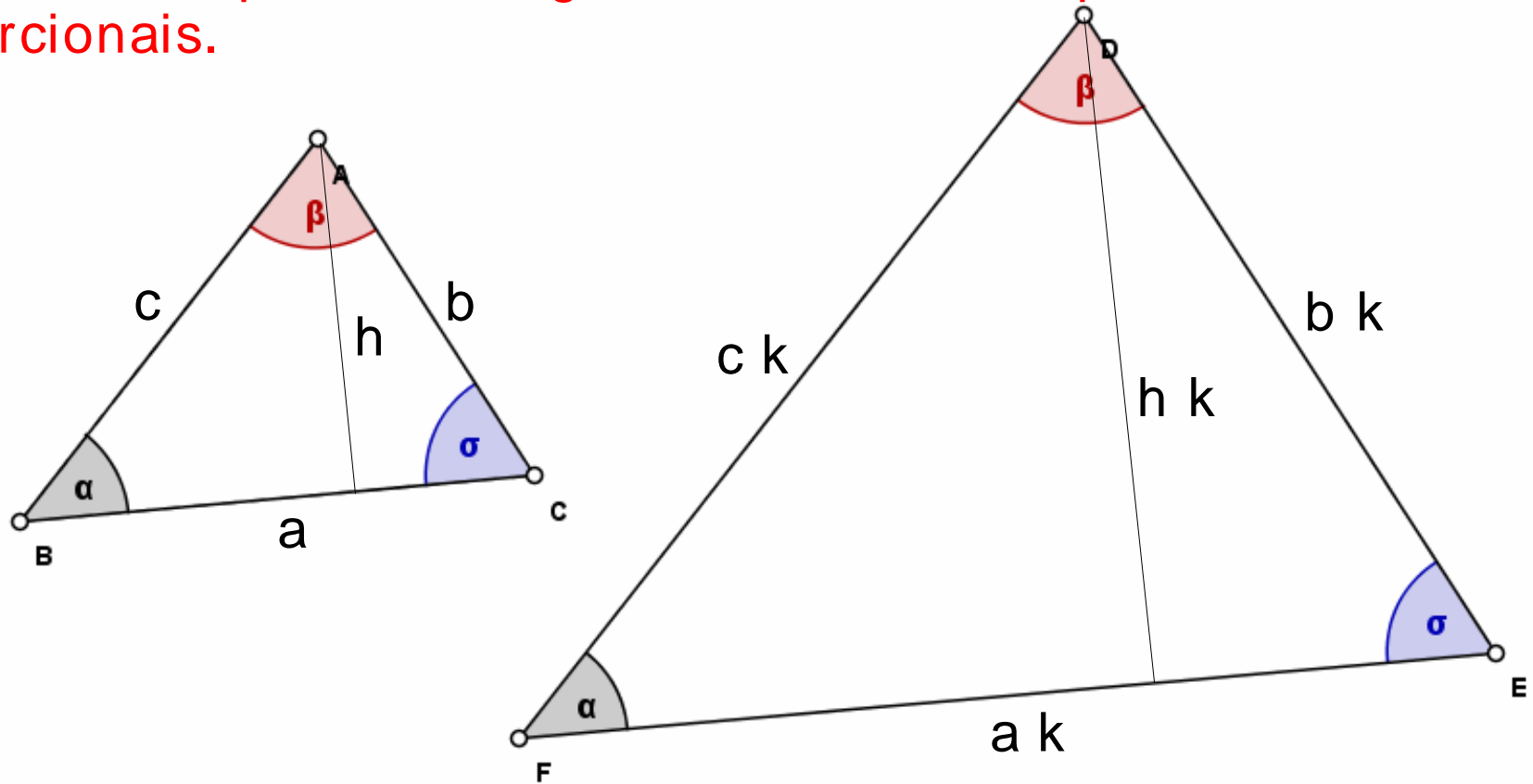


# Semelhança de triângulos

Dois triângulos são ditos semelhantes quando possuem **ângulos internos correspondentes iguais** e **lados correspondentes proporcionais**.



Simbologia:  $\Delta ABC \sim \Delta DEF$

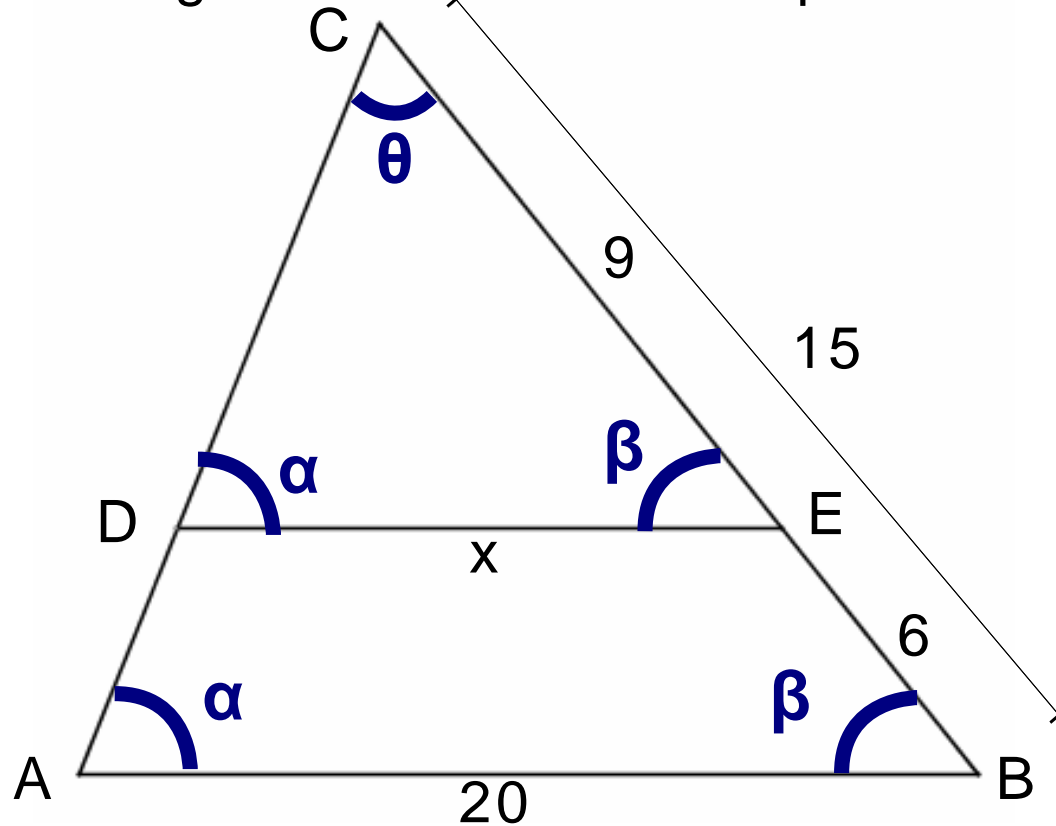
Razão de semelhança

$$\frac{ak}{a} = \frac{bk}{b} = \frac{ck}{c} = \frac{hk}{h} = \mathbf{K}$$

Questão 1 – Na figura, os segmentos AB e DE são paralelos:

Qual o valor de x?

- a) 30
- b) 12
- c) 15
- d) 18



$$\frac{\theta}{20} = \frac{\alpha}{15}$$

$$15 \cdot x = 20 \cdot 9$$

$$x = \frac{20 \cdot 9}{15}$$

$$x = 12$$

Questão 3 – Os lados de um triângulo ABC são AB = 15 cm, BC = 10 cm e AC = 20 cm. Se AM = 3 cm, MN // AC e MP // BC, o perímetro do paralelogramo MNCP é

- a) 26 cm
- b) 30 cm
- c) 32 cm
- d) 36 cm**
- e) 40 cm

$$\frac{\beta}{12} = \frac{\alpha}{15}$$

$$\frac{12}{15} = \frac{y}{20}$$

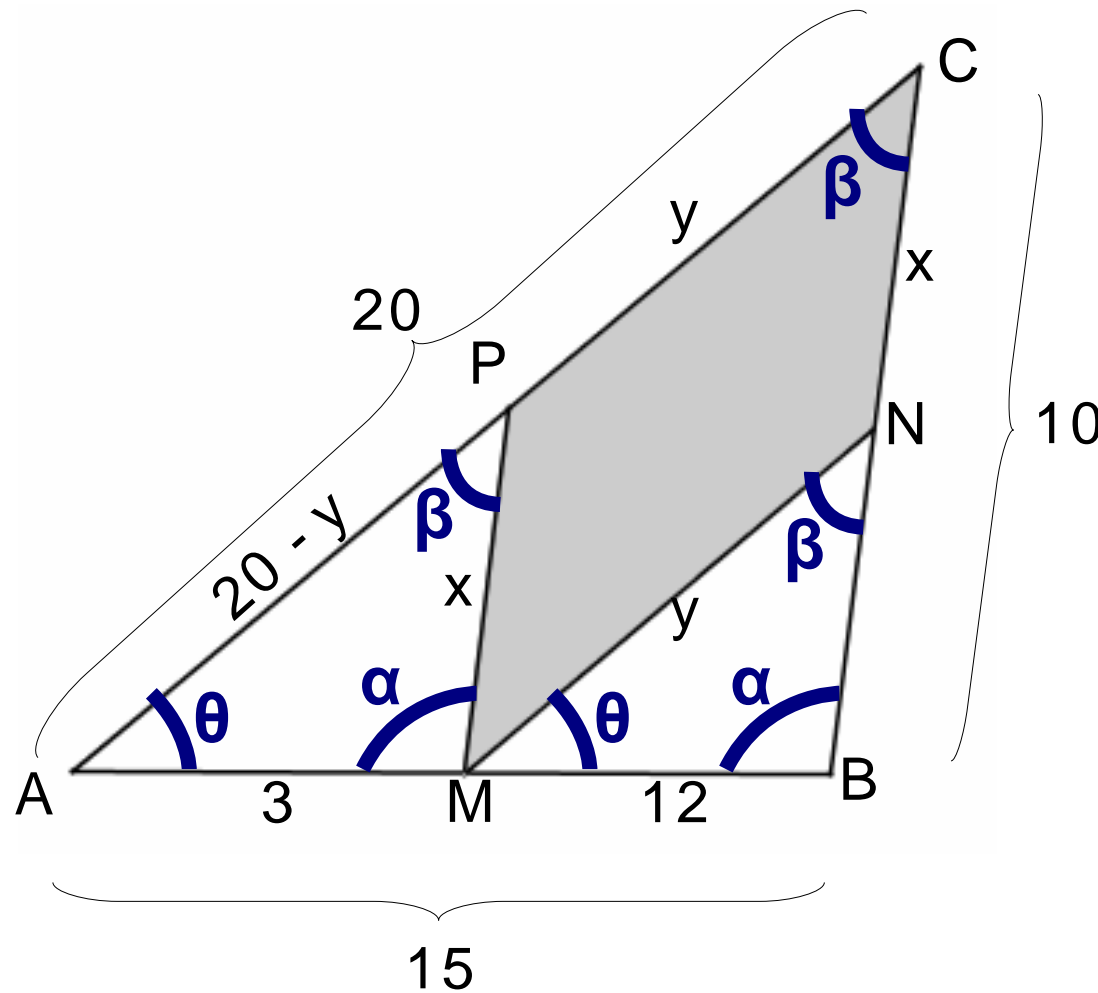
$$15y = 12 \cdot 20$$

$$y = \frac{12 \cdot 20}{15}$$

$$y = \frac{12 \cdot 4}{3}$$

$$y = 4 \cdot 4$$

$y = 16$



$$\frac{\beta}{3} = \frac{\theta}{10}$$

$$15x = 3 \cdot 10$$

$$y = \frac{3 \cdot 10}{15}$$

$$y = \frac{30}{15}$$

$y = 2$

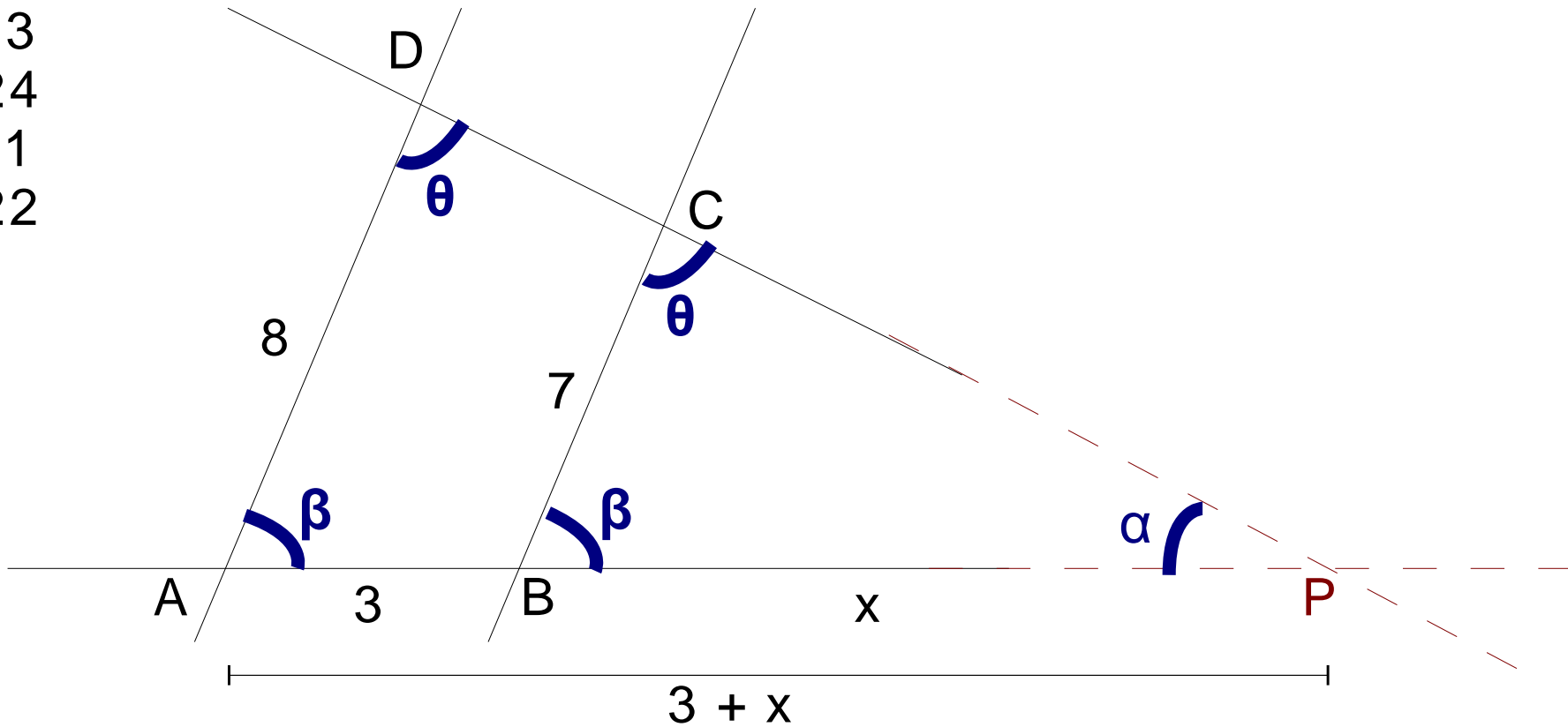
$$\text{perímetro} = 2p = 2x + 2y$$

$$2 \cdot 2 + 2 \cdot 16$$

$$4 + 32 = 36$$

Questão 4 – Observe a figura:

- a) 23
- b) 24
- c) 21
- d) 22



$\alpha$     $\beta$

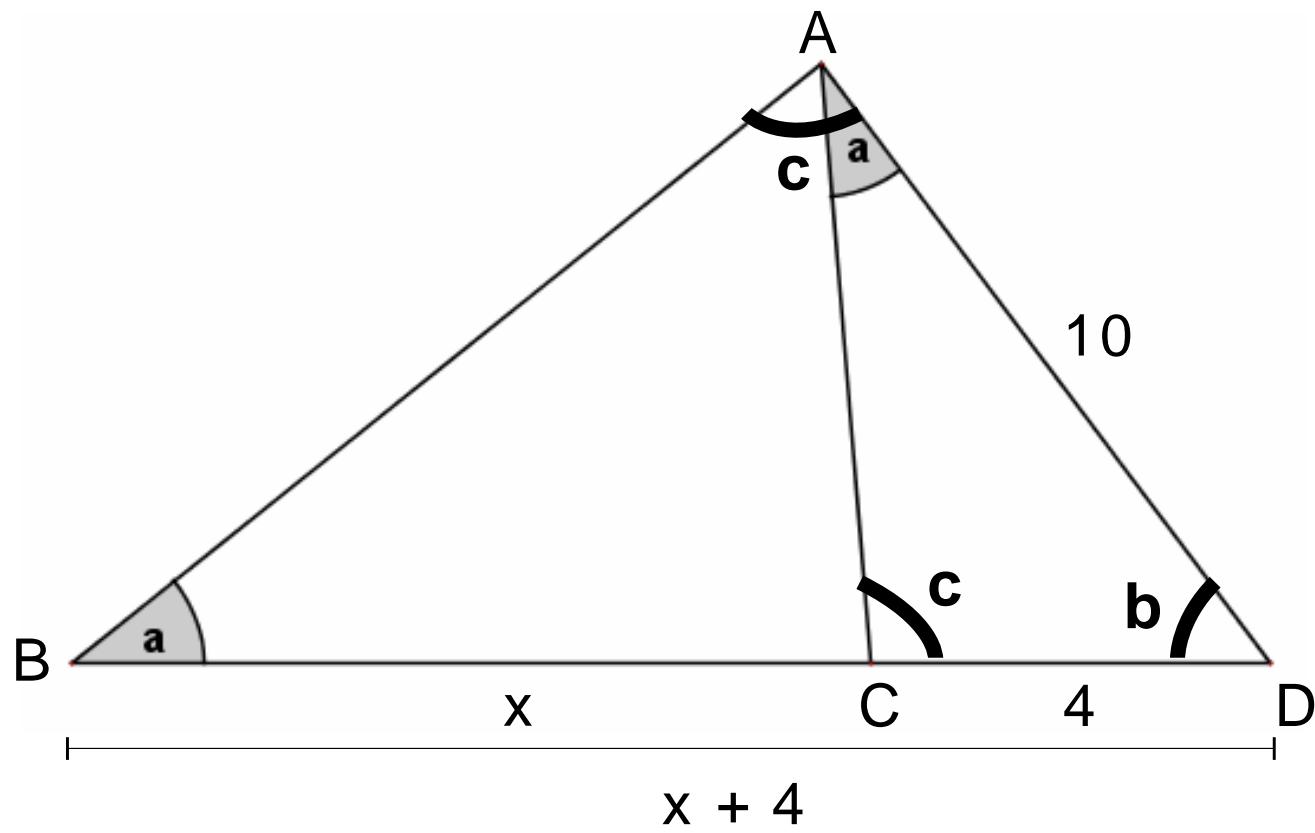
$$\frac{7}{8} = \frac{x}{x+3}$$

$$8x = 7(x + 3)$$

$$8x = 7x + 21 \longrightarrow \boxed{x = 21}$$

Questão 9 –

- a) 21
- b) 22
- c) 23
- d) 24



$$\frac{4}{10} = \frac{10}{x+4}$$

$$4(x+4) = 10 \cdot 10 \quad 4x = 84$$

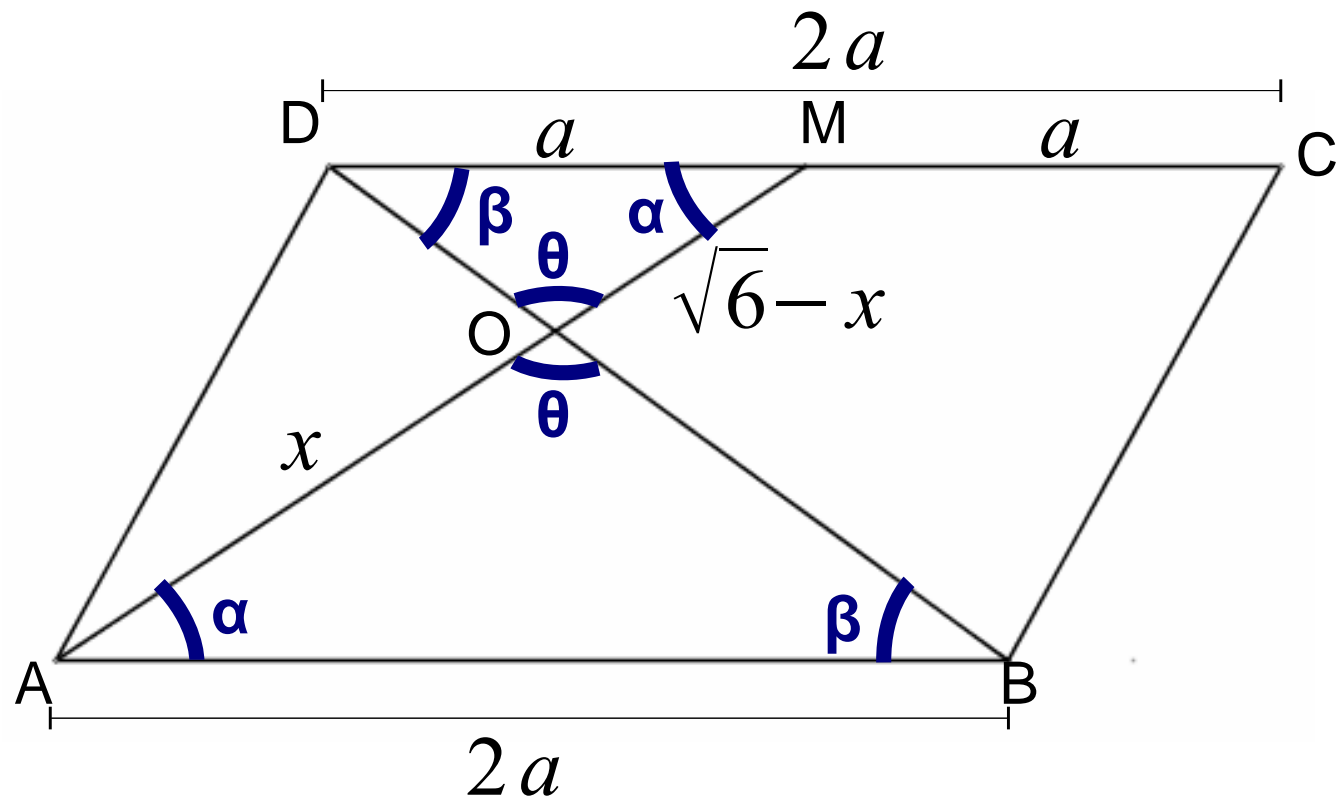
$$4x + 16 = 100$$
$$4x = 100 - 16$$

$$x = \frac{84}{4}$$

$$x = 21$$

Questão 15 –  $AM = \sqrt{6}$  cm

- a)  $\frac{3\sqrt{3}}{4}$
- b)  $\frac{3\sqrt{6}}{9}$
- c)  $\frac{2\sqrt{6}}{3}$**
- d)  $\frac{7\sqrt{6}}{9}$
- e)  $\sqrt{2}$



$$\frac{\beta}{\alpha} = \frac{\theta}{\theta}$$

$$\frac{\sqrt{6} - x}{x} = \frac{a}{2a}$$

~~$$\frac{\sqrt{6} - x}{x} = \frac{1}{2}$$~~

$$2(\sqrt{6} - x) = 1x$$

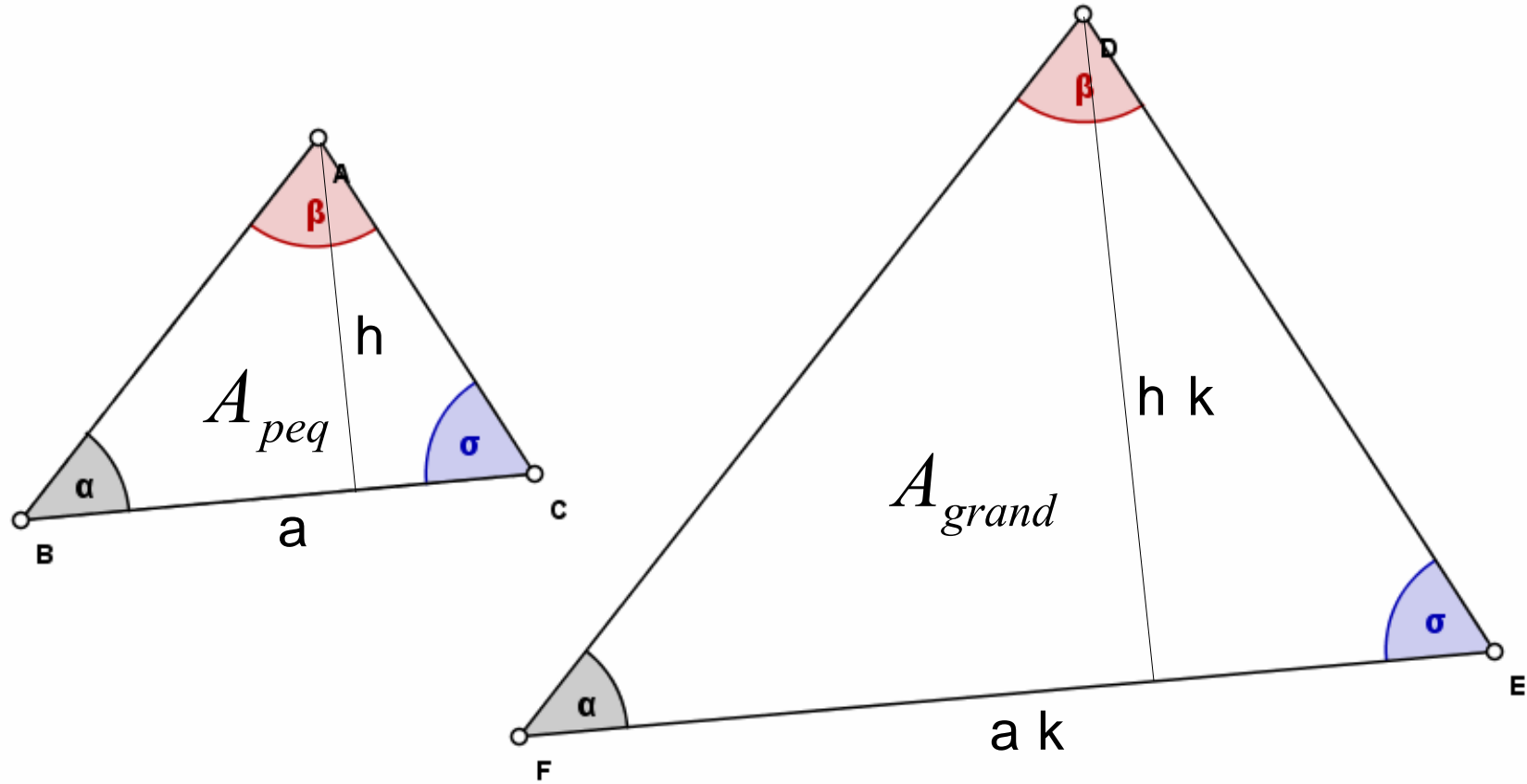
$$2\sqrt{6} - 2x = x$$

$$2\sqrt{6} = x + 2x$$

$$2\sqrt{6} = 3x$$

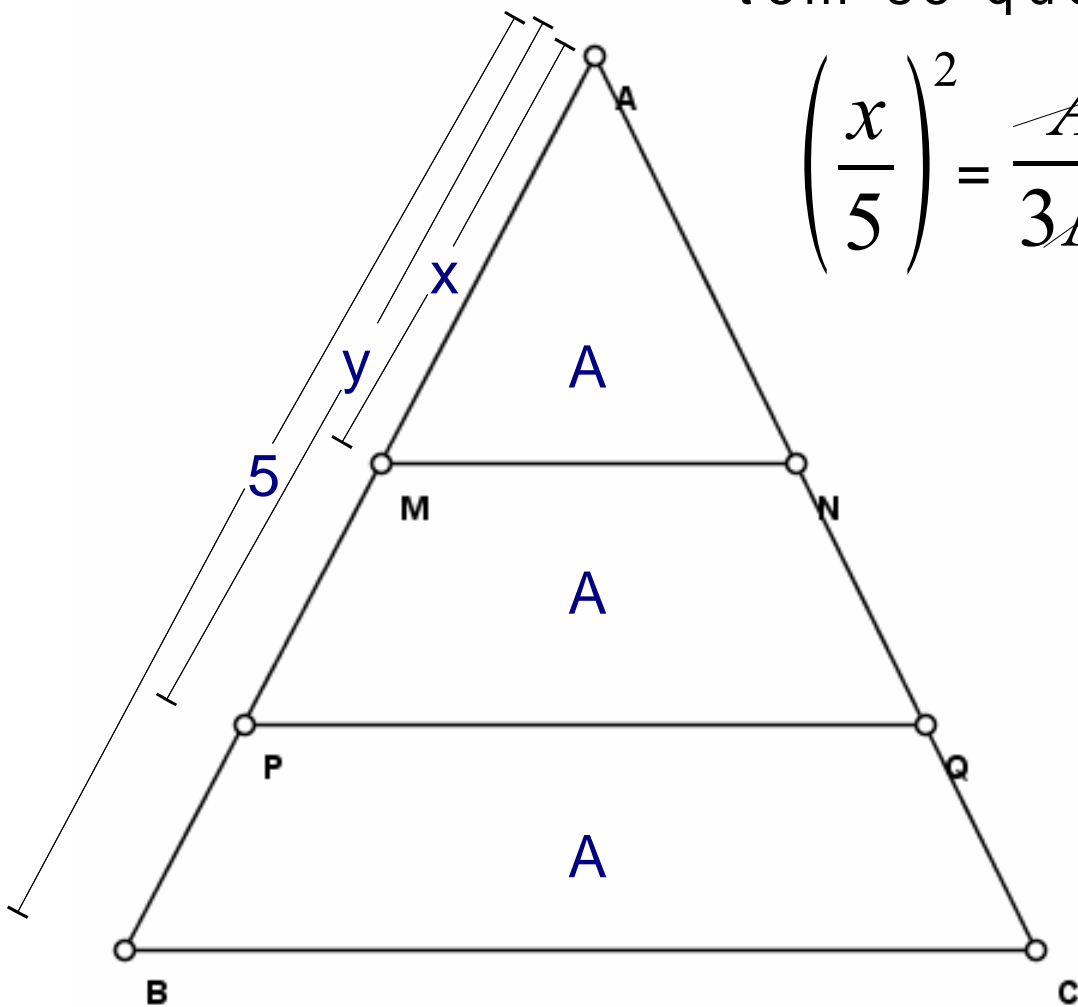
$$x = \frac{2\sqrt{6}}{3}$$

# Áreas de triângulos Semelhantes



$$\frac{A_{grand}}{A_{peq}} = k^2$$

UFMG (2ª etapa) – De acordo com a figura  $AM = x$ ,  $AP = y$   $A_{\Delta AMN} = A$ ,  $A_{\Delta APQ} = 2A$  e  $A_{\Delta ABC} = 3A$  tem-se que:



$$\left(\frac{x}{5}\right)^2 = \frac{A}{3A} \quad \frac{x^2}{25} = \frac{1}{3}$$

$$x^2 = \frac{25}{3}$$

$$x = \sqrt{\frac{25}{3}}$$

$$x = \frac{5\sqrt{3}}{\sqrt{3}\sqrt{3}}$$

$$x = \frac{5\sqrt{3}}{3}$$

$$\left(\frac{y}{5}\right)^2 = \frac{2A}{3A}$$

$$\frac{y^2}{25} = \frac{2}{3}$$

$$y^2 = \frac{25 \cdot 2}{3}$$

$$y = \sqrt{\frac{25 \cdot 2}{3}}$$

$$y = \frac{5\sqrt{2}\sqrt{3}}{\sqrt{3}\sqrt{3}}$$

$$y = 5\frac{\sqrt{6}}{3}$$