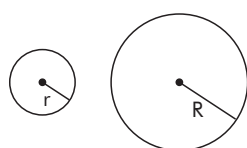


# Exercícios de casa resolvidos

Extensivo — Caderno 5 — Matemática II

Aula 22

12.



$$C_{\text{menor}} = 2\pi r$$

$$C_{\text{maior}} = 2\pi R$$

PA:  $C_{\text{menor}}, C_{\text{maior}}, \dots \Rightarrow C_{\text{maior}} = C_{\text{menor}} + 2 \Rightarrow 2\pi R = 2\pi r + 2 \Rightarrow 2\pi R - 2\pi r = 2 \Rightarrow$   
 $2\pi(R - r) = 2 \Rightarrow R - r = \frac{1}{\pi} \Rightarrow R = r + \frac{1}{\pi} \Rightarrow$  Os raios formam PA de razão  $\frac{1}{\pi}$ .

**Resposta: E**

$$18. f(n + 1) = f(n) + 3 \Rightarrow \begin{cases} f(0 + 1) = f(0) + 3 \Rightarrow f(1) = 1 + 3 \Rightarrow f(1) = 4 \\ f(1 + 1) = f(1) + 3 \Rightarrow f(2) = 4 + 3 \Rightarrow f(2) = 7 \\ f(2 + 1) = f(2) + 3 \Rightarrow f(3) = 7 + 3 \Rightarrow f(3) = 10 \end{cases}$$

$f(1), f(2), f(3), \dots$  formam uma PA de razão 3

$$f(200) = a_{200} = a_1 + 199 \cdot r = 4 + 199 \cdot 3 = \mathbf{601}$$

**Resposta: C**

Aula 23

11. PA:  $x, y, z \Rightarrow 2y = x + z$

$$x + y + z = 15 \Rightarrow \underbrace{x + z}_{2y} + y = 15 \Rightarrow 3y = 15 \Rightarrow y = 5$$

$$\text{PG: } x, y + 1, z + 5 \Rightarrow (y + 1)^2 = x \cdot (z + 5) \Rightarrow 6^2 = x(z + 5)$$

$$\begin{cases} x + z = 10 \\ x(z + 5) = 36 \end{cases} \Rightarrow \begin{cases} x = 12, z = -2 \text{ (não convém, pois } 0 < z < 10) \\ x = 3, z = 7 \end{cases}$$

$$3z = 3 \cdot 7 = \mathbf{21}$$

**Resposta: E**

$$15. \frac{\pi}{12} = \frac{\pi}{3} - \frac{\pi}{4} \Rightarrow \sin \frac{\pi}{12} = \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} \cdot \frac{1}{2} = \frac{\sqrt{6} - \sqrt{2}}{4}$$

$$\frac{5\pi}{12} = \frac{3\pi}{12} + \frac{2\pi}{12} = \frac{\pi}{4} + \frac{\pi}{6} \Rightarrow \sin \frac{5\pi}{12} = \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{1}{2} \cdot \frac{\sqrt{2}}{2} = \frac{\sqrt{6} + \sqrt{2}}{4}$$

PA:  $\sin \frac{\pi}{12}$ ,  $\sin a$ ,  $\sin \frac{5\pi}{12}$

$$2 \sin a = \sin \frac{\pi}{12} + \sin \frac{5\pi}{12} = 2 \cdot \frac{\sqrt{6}}{4} \Rightarrow \sin a = \frac{\sqrt{6}}{4}$$

Resposta: D

Aula 24

$$11. p(1) = 2^{100} + 2^{99} \cdot 1 + 2^{98} \cdot 1^2 + \dots + 1^{100}$$

$$p(1) = \underbrace{2^{100} + 2^{99} + 2^{98} + \dots + 2^0}_{\text{soma de PG de 101 termos}}$$

$$p(1) = \frac{2^{100} - 2^0 \cdot \frac{1}{2}}{1 - \frac{1}{2}} = 2^{101} - 1$$

$$p(2) = 2^{100} + 2^{99} \cdot 2 + 2^{98} \cdot 2^2 + \dots + 2^{100}$$

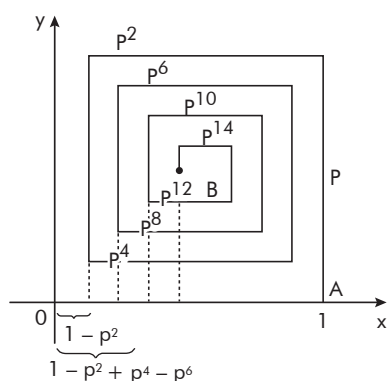
$$p(2) = \underbrace{2^{100} + 2^{100} + 2^{100} + \dots + 2^{100}}_{101 \text{ termos}}$$

$$p(2) = 101 \cdot 2^{100}$$

$$p(1) + p(2) = 2^{101} - 1 + 101 \cdot 2^{100} = 2 \cdot 2^{100} - 1 + 101 \cdot 2^{100} = 103 \cdot 2^{100} - 1$$

Resposta: C

12.



$$x_B = 1 - p^2 + p^4 - p^6 + p^8 - p^{10} + p^{12} - p^{14} \text{ (soma de PG de razão } -p^2 \text{)}$$

$$x_B = \frac{1 - (-p^{14})(-p^2)}{1 - (-p^2)} = \frac{1 - p^{16}}{1 + p^2}$$

Resposta: D

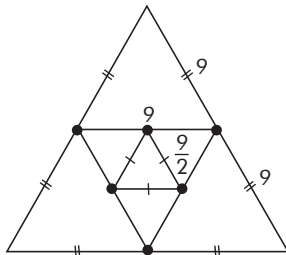
Aula 25

$$5. \sum_{n=1}^{\infty} \left( \frac{1}{3^n} - \frac{1}{4^n} \right) = \frac{1}{3} - \frac{1}{4} + \frac{1}{9} - \frac{1}{16} + \frac{1}{27} - \frac{1}{64} + \dots = \underbrace{\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \dots}_{PG1} - \underbrace{\left( \frac{1}{4} + \frac{1}{16} + \frac{1}{64} + \dots \right)}_{PG2} =$$

$$S_{PG1} - S_{PG2} = \frac{\frac{1}{3}}{1 - \frac{1}{3}} - \frac{\frac{1}{4}}{1 - \frac{1}{4}} = \frac{\frac{1}{3}}{\frac{2}{3}} - \frac{\frac{1}{4}}{\frac{3}{4}} = \frac{1}{2} - \frac{1}{3} = \frac{1}{6}$$

Resposta: C

10.



$$\text{Per1} + \text{Per2} + \text{Per3} + \dots = 3 \cdot 18 + 3 \cdot 9 + 3 \cdot \frac{9}{2} + \dots = 3 \left( 18 + 9 + \frac{9}{2} + \dots \right) = 3 \cdot \frac{18}{1 - \frac{1}{2}} = 3 \cdot 36 = 108$$

Resposta: B