

nielando-resoluções

Equação do 2º grau →

01. a) $4x^2 + 8x + 6 = 0$

$$\Delta = 64 - 4 \cdot 4 \cdot 6$$

$$\Delta = 64 - 96$$

$$\Delta = -32$$

↳ não possui raiz real

b) $x^2 - 4x + 5 = 0$

$$x' + x'' = 4$$

$$x' \cdot x'' = -5$$

$$x' = -1$$

$$x'' = 5$$

02. $x' + x'' = \frac{-(-5)}{2}$

$$x' + x'' = \frac{5}{2}$$

$$x' \cdot x'' = \frac{-4}{2}$$

a) $\frac{5}{2} - \left(\frac{-4}{2}\right) = \frac{5+4}{2} = \frac{12}{2} = 6$

b) $\frac{5}{2} - \frac{4}{2} = \frac{5-4}{2} = \frac{1}{2}$

c) $\frac{5}{2} \cdot \frac{-4}{2} = \frac{-35}{4}$

d) $\frac{5}{2} = \frac{5}{2} \cdot \left(\frac{-4}{4}\right) = \frac{-5}{1}$

e) $\frac{5}{2} > \frac{-4}{2}$

(A)

03. $x' + x'' = \frac{-(-4)}{-1} = \frac{4}{-1} = -4$

$$x' \cdot x'' = \frac{5}{-1} = -5$$

$$x' = -5$$

(C)

$$x'' = 1$$

$$04. 2x^2 + 4x - 6 = 0$$

$$x = \frac{-4 \pm 8}{2 \cdot 2}$$

$$\Delta = 16 - 4 \cdot 2 \cdot (-6)$$

$$\Delta = 16 + 48$$

$$\Delta = 64$$

$$x' = \frac{-4 + 8}{4} = \frac{4}{4} = 1$$

$$x'' = \frac{-4 - 8}{4} = \frac{-12}{4} = -3$$

$$\frac{C}{a} = \frac{-6}{2} = -3$$

$$P = 1 \cdot (-3) = -3$$

(E)

$$05. a) S = -1 \quad P = -6 \quad x' = -3 \quad x'' = 2 \quad \checkmark$$

$$a. (x - x')(x - x'') =$$

$$= 1 \cdot (x - 2)(x - (-3)) =$$

$$= (x - 2)(x + 3) =$$

$$= x^2 + 3x - 2x - 6 =$$

$$= x^2 + x - 6 = 0$$

(A)

$$06. 50 \cdot (80 - 0)^2 =$$

$$= 50 \cdot 80^2 =$$

$$= 50 \cdot 6400 =$$

$$= 320.000 \text{ Litros}$$

↳ CAPACIDADE INICIAL

$$50 \cdot (80 - 5)^2 =$$

$$= 50 \cdot 75^2 =$$

$$= 50 \cdot 5625 =$$

$$= 281.250$$

↳ CAPACIDADE FINAL

$$320.000 - 281.250 = 38.750$$

(D)

$$07. x^2 - 45x + 500 = 0$$

$$\Delta = 2025 - 4 \cdot 1 \cdot 500$$

$$\Delta = 2025 - 2000$$

$$\Delta = 25$$

$$x = \frac{45 \pm 5}{2 \cdot 1}$$

$$x' = \frac{50}{2} = 25$$

$$P = 2 \cdot (25 + 20)$$

$$P = 2 \cdot 45$$

$$P = 90$$

$$x'' = \frac{40}{2} = 20$$

$$\text{Axtome: } 5 \cdot 90 = 450 \text{ m}$$

K

$$08. \quad 5 = \frac{-b}{a} = \frac{-16}{1} = -16$$

B

$$09. \quad 250t^3 - 100t + 300 = 150t^3 + 69t + 300 \quad \cdot t$$

$$250t^2 - 100 = 150t^2 + 69$$

$$250t^2 - 150t^2 = 69 + 100$$

$$100t^2 = 169$$

$$t^2 = \frac{169}{100}$$

$$t = \sqrt{\frac{169}{100}}$$

A

$$t = \frac{13}{10} = 1,3 \text{ s}$$

$$10. \quad V(x) = (60 + 2 \cdot x)(15 - x)$$

$$V(x) = 900 - 60x + 30x - 2x^2$$

$$V(x) = 900 - 30x - 2x^2$$

K

$$11. \quad \frac{1}{p} + \frac{1}{q} = \frac{4}{3} \quad s = \frac{-(-5)}{2}$$

$$\frac{q+p}{pq} = \frac{4}{3} \quad s = 2,5$$

$$\frac{c}{a} = \frac{1,5}{4}$$

$$a - 3 = \frac{15}{4}$$

$$\frac{4c}{2} = 1,5$$

$$a = \frac{15}{4} + 3$$

$$\frac{2,5}{pq} = \frac{4}{3} \quad pq = \frac{1,5}{4}$$

$$c = \frac{1,5}{4}$$

$$a = \frac{15 + 12}{4} = \frac{27}{4} = 6,75$$

- 01) ✗
 02) ✓
 04) ✓
 08) ✓
 16) ✓

R/30

12. $\alpha + \beta = -\frac{7}{3}$ $\alpha^2\beta + \alpha\beta^2 - \alpha - \beta = 0$

$-\alpha - \beta = \frac{7}{3}$ $\alpha\beta(\alpha + \beta) + \frac{7}{3} = 0$

$\alpha\beta = -\frac{18}{3} = -6$ $-6 \cdot -\frac{7}{3} + \frac{7}{3} =$

(B)

$= \frac{42}{3} + \frac{7}{3} = \frac{49}{3}$

13. $v = \frac{180}{n} \Rightarrow n = \frac{180}{v}$

$(n-6)(v+2) = v \cdot (30+n)$

$\left(\frac{180}{v} - 6\right)(v+2) = v \cdot \left(30 + \frac{180}{v}\right)$

$\left(\frac{180-6v}{v}\right) \cdot (v+2) = v \cdot \left(\frac{30v+180}{v}\right)$

$\frac{(180-6v)(v+2)}{v} = 30v + 180$

$180v + 360 - 6v^2 - 12v = 30v^2 + 180v$

$-36v^2 - 12v + 360 = 0 \quad \div 12$

$-3v^2 - v + 30 = 0$

$\Delta = 1 - 4 \cdot (-3) \cdot (30)$

$\Delta = 361$

$x = \frac{1 \pm 19}{2 \cdot -3}$

$x' = \frac{20}{-6} = -\frac{10}{3}$

(C)

$x'' = \frac{-18}{-6} = 3$

$$14. v = \frac{135}{q_0}$$

$$(v - 2)(q_0 + 1) = 130$$

$$\left(\frac{135 - 2}{q_0}\right)(q_0 + 1) = 130$$

$$\left(\frac{135 - 2q_0}{q_0}\right)(q_0 + 1) = 130$$

$$(135 - 2q_0)(q_0 + 1) = 130q_0$$

$$135q_0 + 135 - 2q_0^2 - 2q_0 = 130q_0$$

$$-2q_0^2 - 3q_0 + 135 = 0$$

$$\Delta = 9 - 4 \cdot (-2) \cdot (135)$$

$$\Delta = 1089$$

$$x = \frac{3 \pm 33}{-2 \cdot 2}$$

$$x' = \frac{30}{-4} = -\frac{15}{2} \quad x'' = \frac{-36}{-4} = 9$$

1ª compra: 9

2ª compra: 9 + 1 = 10

TOTAL = 19

(C)

$$15. \frac{342}{n} = v$$

$$(v + 19)(n - 3) = 342$$

$$\left(\frac{342 + 19n}{n}\right)(n - 3) = 342$$

$$(342 + 19n)(n - 3) = 342n$$

$$\cancel{342n} - 1026 + 19n^2 - 57n = \cancel{342n} \quad \div 19$$

$$19n^2 - 57n - 1026 = 0 \quad \div 19$$

$$n^2 - 3n - 54 = 0$$

$$\Delta = 9 - 4 \cdot 1 \cdot (-54)$$

$$\Delta = 225$$

$$n = \frac{3 \pm 15}{2 \cdot 1} = \frac{18}{2} = 9 \text{ amigos}$$

16. $\frac{600}{n} = x$ $\frac{600}{15} = x$ $x = 40 \text{ km/dia}$

$$(x + 10) \cdot (n - 3) = 600$$

$$\left(\frac{600 + 10n}{n}\right) \cdot (n - 3) = 600$$

$$(600 + 10n)(n - 3) = 600n$$

$$600n - 1800 + 10n^2 - 30n = 600n$$

$$n^2 - 3n - 180 = 0$$

$$\Delta = 9 - 4 \cdot 1 \cdot (-180) \quad n = \frac{3 \pm 27}{2}$$

$$\Delta = 9 + 720$$

$$\Delta = 729$$

$$n = \frac{30}{2} = 15 \text{ dias}$$

01) ✗

02) ✗

R/12

04) ✓

08) ✓

17. $x^2 - 135x + 1800 = 0$

$$\Delta = 18225 - 4 \cdot 1 \cdot 1800$$

$$\Delta = 18225 - 7200$$

$$\Delta = 11025$$

$$x = \frac{135 \pm 105}{2}$$

$$2011 - 120 = 1891$$

$$1 + 8 + 9 + 1 = 19$$

$$x = \frac{240}{2} = 120$$

E

18. $x^2 + 1 = 0$

$$x^2 = -1$$

$$x^2 - 25 = 0$$

$$x^2 = 25$$

$$x^2 - 5x + 6 = 0$$

$$x' + x'' = 5$$

$$x = \sqrt{-1}$$

→ não é real

$$x = \sqrt{25}$$

$$x' = 5 \quad x'' = -5$$

$$x' \cdot x'' = 6$$

$$x' = 2$$

$$x'' = 3$$

$$5 - 5 + 2 + 3 = 5$$

(C)

$$19. \quad 5 = \frac{-(-5)}{2} = \frac{5}{2}$$

$$\frac{1}{m} + \frac{1}{n} = \frac{n+m}{m \cdot n} = \frac{5}{2} = \frac{5}{2} \cdot \left(\frac{-1}{2}\right) = -\frac{5}{4}$$

$$p = -\frac{4}{2} = -2$$

(A)

$$20. \quad x'^2 + x''^2 = 25$$

$$(x' + x'')^2 = x'^2 + 2 \cdot x' \cdot x'' + x''^2$$

$$\left(\frac{-a}{1}\right)^2 = 25 + 2 \cdot 12$$

$$a^2 = 25 + 24$$

$$a^2 = 49$$

$$a = 7$$

(A)