

13) $0,211 - 3,22 \div 3,222... - 1,71333...$

$$\frac{1,2323... - 5,2}{2,000} = \frac{12,555... + 26}{3 + 0,222... - (1 + 0,71333...)}$$

$$\frac{1 + 0,2123... - \frac{52}{10}}{2,000} = \frac{12 + 0,199... + 26}{3 + \frac{2}{9} - (1 + 0,71 + 0,00333...)}$$

$$\frac{1 + \frac{23}{100} - \frac{52}{10}}{2,000} = \frac{12 + \frac{2}{9} + 26}{3 + \frac{2}{9} - (1 + \frac{71}{100} + \frac{3}{900})}$$

$$\frac{3960 + 230 - 520}{990} = \frac{108 + 9 + 239}{2700 + 200 - 900 - 666 - 9}$$

$$\frac{-3,006}{2,000} = \frac{396}{9}$$

$$\frac{-938}{990} = \frac{1,331}{900}$$

$$\frac{148,797}{57,900} = \frac{1,331}{900,000} \cdot 396$$

$$\frac{148,797}{57,900} = \frac{1,331}{39,600} \cdot 396$$

$$\frac{148,797}{57,900} = \frac{1,331}{1,331} \cdot 396$$

$$\frac{148,797}{57,900} = 1,331$$

$$\begin{aligned} 51.587.686 \\ 637.599 \\ 80,75 \end{aligned}$$

1.1 Cálculo de porcentagem *

1) 10% de 29 + 1,2% de 17

$$\begin{array}{r} 29 \\ \times 0,10 \\ \hline 00 \\ 29 \\ \hline 02,90 \end{array} \quad \begin{array}{r} 17 \\ \times 0,012 \\ \hline 34 \\ 68 \\ \hline 00 \\ 00 \\ \hline 0,204 \end{array}$$

$$\begin{array}{r} 2,9 \\ + 0,204 \\ \hline 3,104 \end{array}$$

2) 5,3% de 18,43 - 3,5% de 2,7

$$\begin{array}{r} 18,43 \\ \times 0,053 \\ \hline 0,97785 \end{array} \quad \begin{array}{r} 2,7 \\ \times 0,035 \\ \hline 0,0918 \end{array} \quad \begin{array}{r} 0,97785 \\ - 0,0918 \\ \hline 0,88605 \approx 0,8861 \end{array}$$

3) 0,5% de 125 + 1,6% de 239,25

$$\begin{array}{r} 125 \\ \times 0,005 \\ \hline 0,5 \end{array} \quad \begin{array}{r} 239,25 \\ \times 0,016 \\ \hline 3,798 \end{array} \quad \begin{array}{r} 0,5 \\ + 3,798 \\ \hline 4,298 \end{array}$$

4) 9% de 1.439,25 + 3,6% de 17.432

$$\begin{array}{r} 1.439,25 \\ \times 0,09 \\ \hline 57,57 \end{array} \quad \begin{array}{r} 17.432 \\ \times 0,036 \\ \hline 627,552 \end{array} \quad \begin{array}{r} 57,57 \\ + 627,552 \\ \hline 685,122 \end{array}$$

1.3 Potenciação

1.3.1 Potência de expoente inteiro > PÁGINA 20

1) $2^3 = 8$

2) $(-2)^3 = -8$

3) $2^0 = 1$

4) $2^{-5} = \frac{1}{2^5} = \frac{1}{32}$

DO LIVRO MATEMÁTICA 1 PARA OS CURSOS DE ECONOMIA, ADMINISTRAÇÃO E CIÊNCIAS CONTÁBEIS (MEDEIROS, 5ª EDIÇÃO, EDITORA ATLAS)

$$5) \left(\frac{2}{5}\right)^3 = \frac{2^3}{5^3} = \frac{8}{125}$$

$$6) (2^3)^2 = 2^6 = 64$$

$$7) \left(\frac{1}{2}\right)^{-3} = \frac{1^{-3}}{2^{-3}} = \frac{\frac{1}{1^3}}{\frac{1}{2^3}} = \frac{\frac{1}{1}}{\frac{1}{8}} = \frac{1 \cdot 8}{1 \cdot 1} = 8$$

$$8) \frac{3^7}{3^5} = 3^{7-5} = 3^2 = 27$$

$$9) ((-1)^3)^4 = (-1)^{12} = 1$$

$$10) (0,5)^3 = 0,125$$

$$11) (-0,1)^3 = -0,001$$

$$12) 1 + (0,41)^2 = 1 + 0,1681 = 1,1681$$

$$13) \frac{1}{4} + 5^3 - 2^{-5} \quad \begin{array}{r} 4 + 2000 - 1 \\ 16 \\ \hline 2.003 \\ 16 \\ \hline 123,1875 \end{array}$$

$$\frac{1}{4} + 125 - \frac{1}{2^5} \quad \frac{1}{4} + 125 - \frac{1}{16}$$

$$14) -(-1)^3 = -(-1) = 1$$

95 $2^{-3} + (-4)^{-5}$

$\frac{1}{2^3} - \frac{1}{4^5}$

$\frac{1}{8} - \frac{1}{1024}$

$\frac{128}{1024} - \frac{1}{1024}$

$\frac{127}{1024}$

(26) $(0,333\dots)^2 + (2,181818\dots)^{-1}$
 $\left(\frac{3}{9}\right)^2 + \left(2 + 0,181818\dots\right)^{-1}$
 $\left(\frac{1}{3}\right)^2 + \left(2 + \frac{18}{99}\right)^{-1}$
 $\frac{1^2}{3^2} + \left(\frac{198+18}{99}\right)^{-1}$
 $\frac{1}{9} + \left(\frac{216}{99}\right)^{-1}$ Divide por 6
 $\frac{1}{9} + \left(\frac{24}{11}\right)^{-1}$

$\frac{1}{9} + \frac{25^{-1}}{11^{-1}}$
 $\frac{1}{9} + \frac{\frac{1}{25}}{\frac{1}{11}}$
 $\frac{1}{9} + \frac{1}{25} \cdot \frac{11}{1}$
 $\frac{1}{9} + \frac{11}{25}$
 $\frac{8+33}{72}$
 $\frac{41}{72}$

17 $\left(\frac{5-1+1}{5 \cdot 2}\right)^{-2} + \frac{1}{1+3^2-(5-5)^{-2}}$

$\left(\frac{8-5+10}{10}\right)^{-2} + \frac{1}{1+9-(-1)^{-2}}$

$\left(\frac{13}{10}\right)^{-2} + \frac{1}{10 - \left(\frac{1}{(-1)^2}\right)}$

$\frac{(13)^{-2}}{(10)^{-2}} + \frac{1}{10 - (1)}$

$\frac{\frac{1}{13^2}}{\frac{1}{10^2}} + \frac{1}{10-1}$

$\frac{\frac{1}{169}}{\frac{1}{100}} + \frac{1}{9}$

$\frac{1 \cdot \frac{100}{1}}{169} + \frac{1}{9}$

$\frac{100}{169} + \frac{1}{9}$

$\frac{900 + 169}{1.521} = \frac{1.069}{1.521}$

$$\textcircled{98} \quad \frac{9 \left(\frac{3}{5} - \frac{1}{8} \right)^2 - \frac{1}{6} (-4+1)^{-1} + 1}{\frac{9 \left(\frac{25}{40} - \frac{1}{8} \right)^2 - \frac{1}{6} (-3)^{-1} + 1}} \rightarrow \frac{3.299 + 200 + 3.600}{3.600}$$

$$\frac{9 \left(\frac{19}{40} \right)^2 - \frac{1}{6} \left(\frac{1}{(-3)^1} \right) + 1}{\left[\frac{9(19)^2}{(40)^2} - \frac{1}{6} \left(\frac{1}{-3} \right) + 1 \right]} \rightarrow \frac{7.099}{3.600}$$

$$\frac{9 \left(\frac{369}{2600} \right) - \frac{1}{6} \left(\frac{1}{3} \right) + 1}{\frac{369}{900} + \frac{1}{18} + 1}$$

$$\textcircled{99} \quad \frac{-\frac{5}{3} (1-3)^3 + \frac{1}{7} (8-1)^{-1}}{-\frac{5}{3} (-2)^3 + \frac{1}{7} (7)^{-1}} \rightarrow \frac{1.960 + 3}{197}$$

$$\frac{-\frac{5}{3} (-8) + \frac{1}{7} \left(\frac{1}{7^1} \right)}{\frac{40}{3} + \frac{1}{7} \cdot \frac{1}{7}} \rightarrow \frac{1.963}{197}$$

$$\frac{\frac{40}{3} + \frac{1}{99}}{\frac{40}{3} + \frac{1}{99}}$$

$$\textcircled{20} \quad 1 + \frac{\left(\frac{1}{3} - 1 \right)^2 - 9(-1+5)^{-1}}{2 - \frac{5}{9} \left(\frac{1-2}{3} \right)^2} \rightarrow 1 + \frac{\frac{(-2)^2}{(3)^2} - 9 \cdot \frac{1}{4}}{2 - \frac{5}{90} \left[\frac{(1)^2}{(3)^2} \right]} \rightarrow 1 + \frac{-\frac{5}{9}}{2 - \frac{5}{90}} \rightarrow 1 + \left(\frac{-50}{176} \right)$$

$$1 + \frac{\left(\frac{1-3}{3} \right)^2 - 9(4)^{-1}}{2 - \frac{5}{90} \left(\frac{3-2}{3} \right)^2} \rightarrow 1 + \frac{\frac{4}{9} - 1}{2 - \frac{5}{90} \left(\frac{1}{9} \right)} \rightarrow 1 + \frac{-\frac{5}{9}}{2 - \frac{5}{90}} \rightarrow 1 + \left(\frac{-50}{176} \right)$$

$$1 + \frac{\left(\frac{-2}{3} \right)^2 - 9 \left(\frac{1}{9} \right)}{2 - \frac{5}{90} \left(\frac{1}{3} \right)^2} \rightarrow 1 + \frac{\frac{4}{9} - 1}{2 - \frac{5}{90}} \rightarrow 1 + \left(\frac{-5}{9} \right) \cdot \frac{90}{176} \rightarrow \frac{176 - 50}{176} = \frac{126}{176} = \frac{63}{88}$$

1.5.2 Potência de expoente racional 2, PÁGINA 22
DO LIVRO MATEMÁTICA 1 PARA OS
CURSOS DE ECONOMIA, ADMINISTRAÇÃO
E CIÊNCIAS CONTÁBEIS (MEDEIROS, 5ª
EDIÇÃO, EDITORA ATLAS)

$$\textcircled{1} \sqrt{49} = \sqrt{7^2} = 7$$

$$\textcircled{2} \sqrt[3]{-125} = \sqrt[3]{-5^3} = -5$$

$$\textcircled{3} \sqrt{0,04} = \sqrt{\frac{4}{100}} = \sqrt{\frac{2^2}{10^2}} = \frac{2^1}{10^1} = \frac{1}{5} = 0,2$$

$$\textcircled{4} \sqrt[3]{-0,008} = \sqrt[3]{-\frac{8}{1000}} = \sqrt[3]{-\frac{2^3}{10^3}} = -\frac{2^1}{10^1} = -\frac{1}{5} = -0,2$$

$$\textcircled{5} (256)^{\frac{3}{4}} = \sqrt[4]{256^3} = \sqrt[4]{(2^8)^3} = \sqrt[4]{2^{24}} = 2^6 = 64$$

$$\textcircled{6} (-1)^{\frac{3}{5}} = \sqrt[5]{(-1)^3} = \sqrt[5]{-1} = -1$$

$$\textcircled{7} (343)^{-\frac{2}{3}} = \sqrt[3]{343^{-2}} = \sqrt[3]{\frac{1}{343^2}} = \sqrt[3]{\frac{1}{(7^3)^2}} = \sqrt[3]{\frac{1}{7^6}} = \frac{1}{7^2} = \frac{1}{49}$$

$$\textcircled{8} (-276)^{-\frac{4}{3}} = \sqrt[3]{(-276)^{-4}} = \sqrt[3]{\frac{1}{(-276)^4}} = \sqrt[3]{\frac{1}{(-2^3 \cdot 3^3)^4}} = \sqrt[3]{\frac{1}{2^{12} \cdot 3^{12}}} = \frac{1}{2^4 \cdot 3^4} = \frac{1}{16 \cdot 81} = \frac{1}{1.296}$$

$$\textcircled{9} \frac{1}{\sqrt{9}} \left(\sqrt[3]{-8} + 5 \sqrt[5]{-32} \right) = \frac{1}{3} (-2 - 10)$$

$$\frac{1}{\sqrt{3^2}} \left(\sqrt[3]{-2^3} + 5 \sqrt[5]{-2^5} \right) = \frac{1}{3} (-2 - 10)$$

$$\frac{1}{3} [-2 + 5(-2)] = -4$$

90

$$\frac{1}{4^{\frac{5}{2}} - 2\sqrt[3]{-729}} \rightarrow \frac{1}{\sqrt{2^{10}} - 2(-9)} \rightarrow \frac{1}{50}$$

$$\frac{1}{\sqrt{4^5} - 2\sqrt[3]{-1(3)^6}} \rightarrow \frac{1}{2^5 + 18}$$

$$\frac{1}{\sqrt{(2^2)^5} - 2[-1(3)^3]} \rightarrow \frac{1}{32 + 18}$$

91

$$\frac{\frac{1}{3}\sqrt{10000} + \frac{1}{\sqrt[3]{16}}}{\sqrt{8281} + 1} \rightarrow \frac{\frac{100}{3} + \frac{1}{2}}{\frac{793}{10} + 1} \rightarrow \frac{\frac{203}{6}}{\frac{203}{10}}$$

$$\frac{\frac{1}{3}\sqrt{1002} + \frac{1}{\sqrt[3]{25}}}{\sqrt{8281} + 1} \rightarrow \frac{\frac{100 + 3}{6}}{\frac{21}{10} + 1} \rightarrow \frac{803 \cdot 10}{6 \cdot 101}$$

$$\frac{\frac{1}{3} \cdot 100 + \frac{1}{2}}{\sqrt{72 \cdot 13^2} + 1} \rightarrow \frac{\frac{100}{3} + \frac{1}{2}}{\frac{91}{10} + 1} \rightarrow \frac{803}{606}$$

$$\frac{1}{10^2} \rightarrow \frac{1}{100} \rightarrow \frac{1}{303}$$

92

$$-\sqrt{36} + \frac{1}{\sqrt{9} - \sqrt[3]{-8}} \rightarrow \frac{-6 + 1}{5}$$

$$-\sqrt{6^2} + \frac{1}{\sqrt{3^2} - \sqrt[3]{(-2)^3}} \rightarrow \frac{-30 + 1}{5}$$

$$-6 + \frac{1}{3 - (-2)} \rightarrow \frac{-29}{5}$$

$$-6 + \frac{1}{3 + 2}$$

2) Valor numérico de expressões algébricas 23

9) $y = x^3 - 2x + 1$; $x = -1$
 $y = (-1)^3 - 2(-1) + 1$
 $y = -1 + 2 + 1 \Rightarrow y = 2$

DO LIVRO MATEMÁTICA 1 PARA OS
 CURSOS DE ECONOMIA, ADMINISTRAÇÃO
 E CIÊNCIAS CONTÁBEIS (MEXINOS, 5ª
 EDIÇÃO, EDITORA ATLAS)

$$\textcircled{2} y = x^5 - x^4 + 3; x = 1$$

$$y = 1^5 - (1)^4 + 3$$

$$y = 1 - 1 + 3$$

$$y = 3$$

$$\textcircled{3} x = \frac{x^5}{5} + \frac{x^4}{4} - 1; x = -1$$

$$x = \frac{(-1)^5}{5} + \frac{(-1)^4}{4} - 1$$

$$x = -\frac{1}{5} + \frac{1}{4} - 1$$

$$x = -\frac{4}{20} + \frac{5}{20} - \frac{20}{20}$$

$$x = -\frac{19}{20}$$

$$\textcircled{4} y = -(x-1)^3 + (1-x)^2 + 1; x = -1$$

$$y = -(-1-1)^3 + (1-(-1))^2 + 1$$

$$y = -(-2)^3 + (1+1)^2 + 1$$

$$y = -(-8) + (2)^2 + 1$$

$$y = 8 + 4 + 1$$

$$y = 13$$

$$\textcircled{5} y = \frac{1}{3}(1-x^3)^2 + \frac{1}{2}(x-1)^2; x = -\frac{1}{2}$$

$$y = \frac{1}{3} \left(1 - \left(-\frac{1}{2} \right)^3 \right)^2 + \frac{1}{2} \left(-\frac{1}{2} - 1 \right)^2$$

$$y = \frac{1}{3} \left(1 - \left(-\frac{1}{8} \right) \right)^2 + \frac{1}{2} \left(\frac{-1-2}{2} \right)^2$$

$$y = \frac{1}{3} \left(1 + \frac{1}{8} \right)^2 + \frac{1}{2} \left(\frac{-3}{2} \right)^2$$

$$y = \frac{1}{3} \left(\frac{2+1}{8} \right)^2 + \frac{1}{2} \cdot \frac{2}{4} \quad y = \frac{27 + 18}{16}$$

$$y = \frac{1}{3} \left(\frac{2}{8} \right)^2 + \frac{9}{8} \quad y = \frac{53}{16}$$

$$y = \frac{1}{3} \cdot \frac{81^{27}}{64^{16}} + \frac{9}{8}$$

$$y = \frac{27}{16} + \frac{9}{8}$$

$$\textcircled{6} y = -\frac{1}{2} (1-x^5)^3 + \frac{2}{3} \left(1 - \frac{1}{2} x^2 \right)^2; x=1$$

$$y = -\frac{1}{2} (1-(1)^5)^3 + \frac{2}{3} \left(1 - \frac{1}{2} (1)^2 \right)^2$$

$$y = -\frac{1}{2} (1-1)^3 + \frac{2}{3} \left(1 - \frac{1}{2} \cdot 1 \right)^2$$

$$y = -\frac{1}{2} (0)^3 + \frac{2}{3} \left(\frac{1}{2} \right)^2$$

$$y = -\frac{1}{2} \cdot 0 + \frac{2}{3} \left(\frac{2 \cdot 1}{2} \right)^2$$

$$y = 0 + \frac{2}{3} \left(\frac{1}{2} \right)^2$$

$$y = \frac{2}{3} \cdot \frac{1}{4}$$

$$y = \frac{1}{6}$$

$$\textcircled{7} y = -\left(4x - \frac{1}{2} \right)^{-2} + \frac{1}{2}; x = \frac{1}{2}$$

$$y = -\left(4 \cdot \frac{1}{2} - \frac{1}{2} \right)^{-2} + \frac{1}{2}$$

$$\begin{aligned}
 y &= -\left(\frac{2-1}{2}\right)^{-2} + \frac{1}{2} & y &= -\left(\frac{\frac{1}{2}}{\frac{2}{9}}\right) + \frac{1}{2} & \rightarrow y &= \frac{1}{18} \\
 y &= -\left(\frac{1-1}{2}\right)^{-2} + \frac{1}{2} & y &= -\left(\frac{1 \cdot \frac{1}{2}}{9}\right) + \frac{1}{2} \\
 y &= -\left(\frac{3}{2}\right)^{-2} + \frac{1}{2} & y &= -\frac{4}{9} + \frac{1}{2} \\
 y &= -\left(\frac{1}{\left(\frac{3}{2}\right)^2}\right) + \frac{1}{2} & y &= \frac{-8 + 9}{18}
 \end{aligned}$$

⑧ $y = \frac{5x^3 - 2x + 1}{3x - 2}; x = -2$

$$y = \frac{5(-2)^3 - 2(-2) + 1}{3(-2) - 2}$$

$$y = \frac{5(-8) + 4 + 1}{-6 - 2}$$

$$y = \frac{-32 + 5}{-8} \rightarrow y = \frac{27}{8}$$

$$y = -\frac{27}{8}$$

⑨ $y = \left(\frac{1}{x-1}\right)^2 + \left(\frac{2x}{x-3}\right)^3 + 1, x = 2$

$$y = \left(\frac{1}{2-1}\right)^2 + \left(\frac{2(2)}{2-3}\right)^3 + 1$$

$$y = \left(\frac{1}{1}\right)^2 + \left(\frac{4}{-1}\right)^3 + 1$$

$$y = 1 + (-64) + 1$$

$$y = 2 - 64$$

$$y = -62$$

$$y = -62$$

$$(10) y = \left(\frac{1-3x^3}{2-x^3} \right) \left(9 - \frac{1-3x}{2x} \right)^2 ; x = -1 \rightarrow y = \left(\frac{4}{3} \right) (9 - (-2))^2$$

$$y = \left(\frac{1-3(-1)^3}{2-(-1)^3} \right) \left(9 - \frac{1-3(-1)}{2(-1)} \right)^2$$

$$y = \frac{4}{3} (9+2)^2$$

$$y = \left(\frac{1-3(-1)}{2-(-1)} \right) \left(9 - \frac{1+3}{-2} \right)^2$$

$$y = \frac{4}{3} (11)^2$$

$$y = \left(\frac{1+3}{2+1} \right) \left(9 - \frac{4}{-2} \right)^2$$

$$y = \frac{4}{3} (12)^2$$

$$y = \frac{576}{3}$$

$$(11) y = \frac{\frac{1}{x} + \frac{2}{x-3} + 2}{4x-3} ; x = \frac{1}{2} \rightarrow y = \frac{2 + 2 \cdot \left(-\frac{2}{5} \right)}{-1} + 2$$

$$y = \frac{\frac{1}{\frac{1}{2}} + \frac{2}{\frac{1}{2}-3} + 2}{4 \cdot \frac{1}{2} - 3} + 2$$

$$y = \frac{2 - \frac{4}{5}}{-1} + 2$$

$$y = \frac{6 \left(-\frac{1}{5} \right) + 2}{5 \left(\frac{1}{2} \right)}$$

$$y = \frac{2 \cdot \frac{2}{1} + \frac{2 \cdot 2}{\frac{1}{2}-3} + 2}{2 \cdot 3} + 2$$

$$y = \frac{\frac{10-4}{5}}{-1} + 2$$

$$y = \frac{-6 + 2}{5}$$

$$y = \frac{2 + \frac{2}{\frac{1}{2}-3}}{-1} + 2$$

$$y = \frac{\frac{6}{5}}{-1} + 2$$

$$y = \frac{-6 + 10}{5}$$

$$y = \frac{4}{5}$$

$$(12) y = \frac{(4+x)^3 - 4^3}{x-4} ; x = -2$$

$$y = \frac{(4+(-2))^3 - 64}{-2-4}$$

$$y = \frac{8 - 64}{-6}$$

$$y = \frac{(4-2)^3 - 64}{-6}$$

$$y = \frac{-56}{-6}$$

$$y = \frac{2^3 - 64}{-6}$$

$$y = \frac{56}{6} \Rightarrow y = \frac{28}{3}$$

13) $y = \sqrt{4-x^2}$; $x = -2$

$$y = \sqrt{4-(-2)^2}$$

$$y = \sqrt{4-(4)}$$

$$y = \sqrt{4-4}$$

$$y = \sqrt{0}$$

$$y = 0$$

14) $y = \frac{1}{\sqrt{1-x^3}}$; $x = -1$

$$y = \frac{1}{\sqrt{1-(-1)^3}} \quad y = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

$$y = \frac{1}{\sqrt{1-(-1)}} \quad y = \frac{\sqrt{2}}{2}$$

$$y = \frac{1}{\sqrt{1+1}}$$

15) $y = \frac{1}{\sqrt{x}} + 2\sqrt{x+12}$; $x = 4$

$$y = \frac{1}{\sqrt{4}} + 2\sqrt{4+12} \quad y = \frac{1}{2} + 2 \cdot 4 \quad y = \frac{17}{2}$$

$$y = \frac{1}{\sqrt{2^2}} + 2\sqrt{16} \quad y = \frac{1}{2} + 8$$

$$y = \frac{1}{2} + 2\sqrt{4^2} \quad y = \frac{1+16}{2}$$

16) $y = \sqrt{x+0,61} - \sqrt{x}$; $x = 9$

$$y = \sqrt{9+0,61} - \sqrt{9}$$

$$y = \sqrt{9,61} - \sqrt{3^2}$$

$$y = \frac{\sqrt{\frac{261}{100}} - 3}{0,1} \rightarrow y = \frac{31-30}{10} \rightarrow y = 1$$

$$y = \frac{\sqrt{\frac{31}{10^2}} - 3}{0,1} \rightarrow y = \frac{1}{10} \rightarrow y = 1$$

$$y = \frac{\frac{31}{10} - 3}{0,1} \rightarrow y = \frac{1}{10} \cdot \frac{40^0}{1} \rightarrow y = 1$$

(17) $y = \frac{x + x\sqrt[3]{x}}{1-x}; x = -1$

$$y = \frac{-1 + (-1)\sqrt[3]{-1}}{1 - (-1)} \rightarrow y = \frac{-1 + 1}{2}$$

$$y = \frac{-1 + (-1)(-1)}{1 + 1} \rightarrow y = \frac{0}{2}$$

$$y = \frac{-1 + (1)}{2} \rightarrow y = 0$$

(18) $y = \frac{\sqrt[3]{x} - \sqrt{x}}{1 + \sqrt{x}}; x = 0$

$$y = \frac{\sqrt[3]{0} - \sqrt{0}}{1 + \sqrt{0}}$$

$$y = \frac{0 - 0}{1 + 0} \rightarrow y = 0$$

$$y = \frac{0}{1}$$

(19) $y = \frac{1}{x^2 - 4} + 1; x = -2$

A expressão não está definida para $x = -2$

1921

20 $y = \frac{x^2 - 9}{x - 3}$; $x = -3$

$$y = \frac{(-3)^2 - 9}{-3 - 3}$$

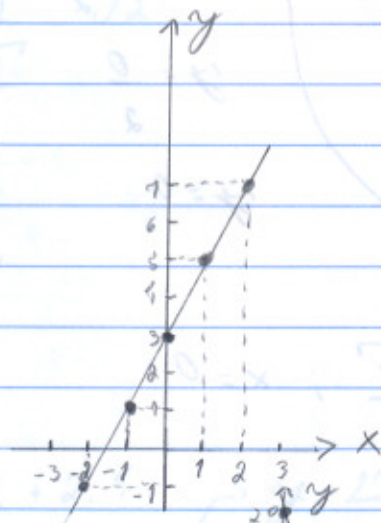
$$y = \frac{9 - 9}{-6} \rightarrow y = 0$$

$$y = \frac{0}{-6}$$

5 Representação gráfica *

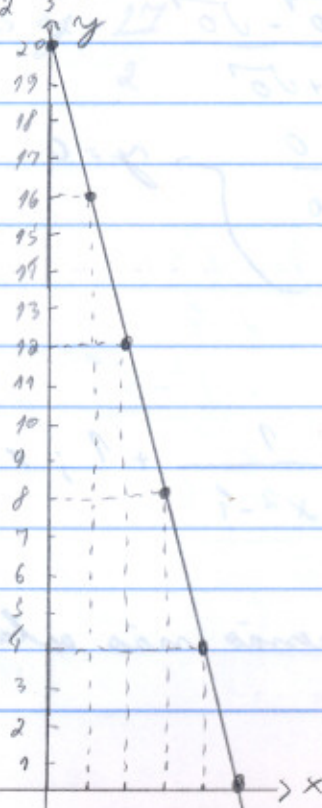
1 $y = 2x + 3$

x	y
-2	-1
-1	1
0	3
1	5
2	7



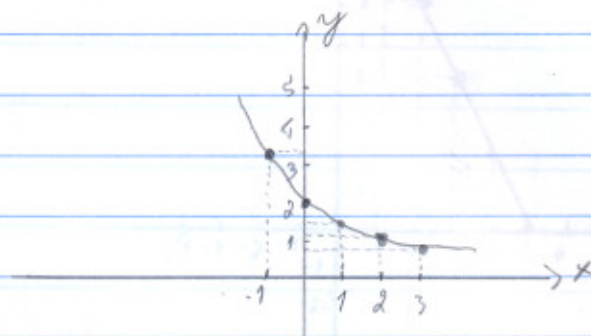
2 $y = 20 - 4x$, $x \in [0, 5]$

x	y
0	20
1	16
2	12
3	8
4	4
5	0



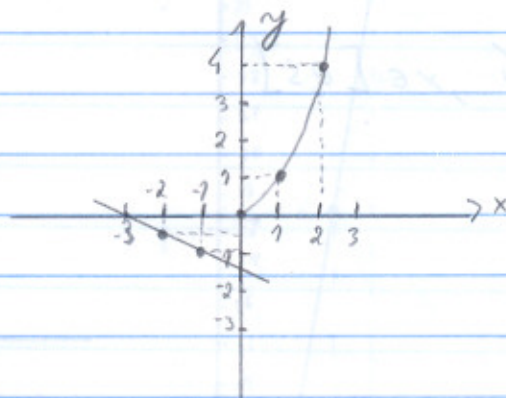
③ $y = \frac{10}{2x+3}, x \in [-1, 3]$

x	y
-1	$\frac{10}{3}, 3,33$
0	2
1	$\frac{10}{5}, 2$
2	$\frac{10}{7}, 1,43$
3	$\frac{10}{9}, 1,11$



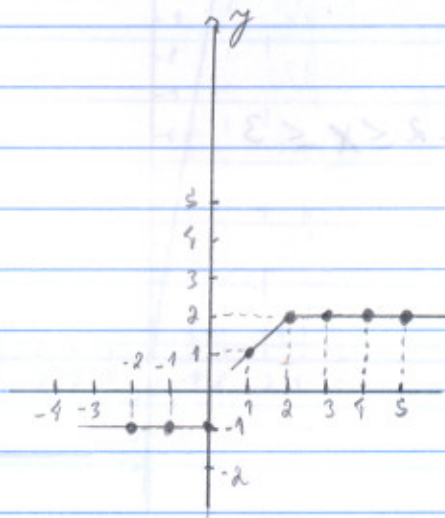
④ $y = \begin{cases} 1 & \text{se } x < 0 \\ x & \\ x^2 & \text{se } x \geq 0 \end{cases}$

x	y
-2	$-\frac{1}{2}$
-1	-1
0	0
1	1
2	4



⑤ $y = \begin{cases} -1 & \text{se } x \leq 0 \\ x & \text{se } 0 < x \leq 2 \\ 2 & \text{se } x > 2 \end{cases}$

x	y
-2	-1
-1	-1
0	-1
1	1
2	2
3	2



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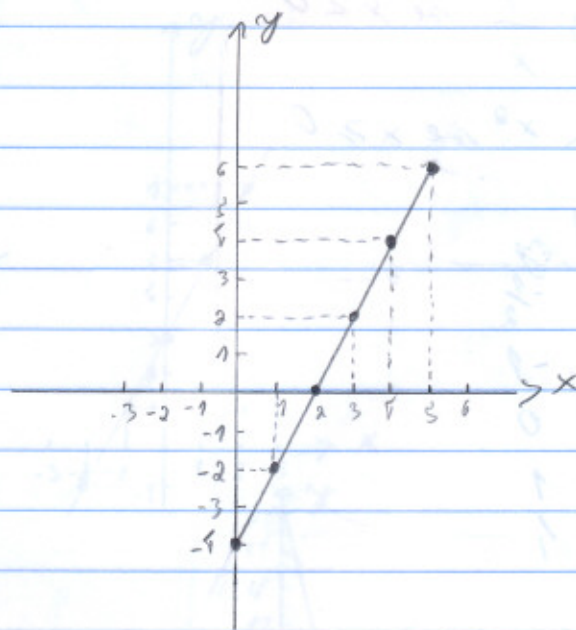
6) $y = \begin{cases} \ln x & \text{se } 0 < x \leq 1 \\ x+1 & \text{se } x > 1 \end{cases}$

x	y
0,5	
1	0
2	3
3	4
4	5

16) Funções Usuais *

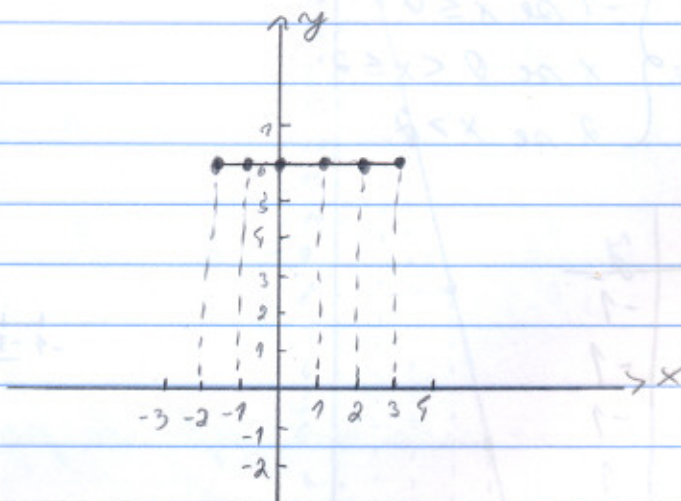
21) $y = 2x - 4, x \in [0, 5]$

x	y
0	-4
1	-2
2	0
3	2
4	4
5	6



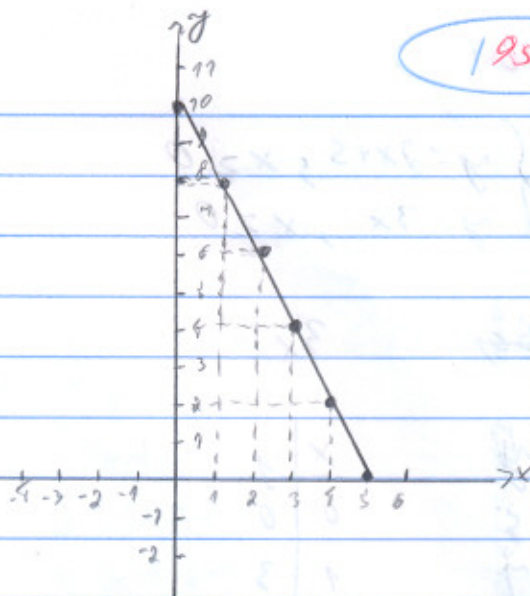
22) $y = 6, -2 \leq x \leq 3$

x	y
-2	6
-1	6
0	6
1	6
2	6



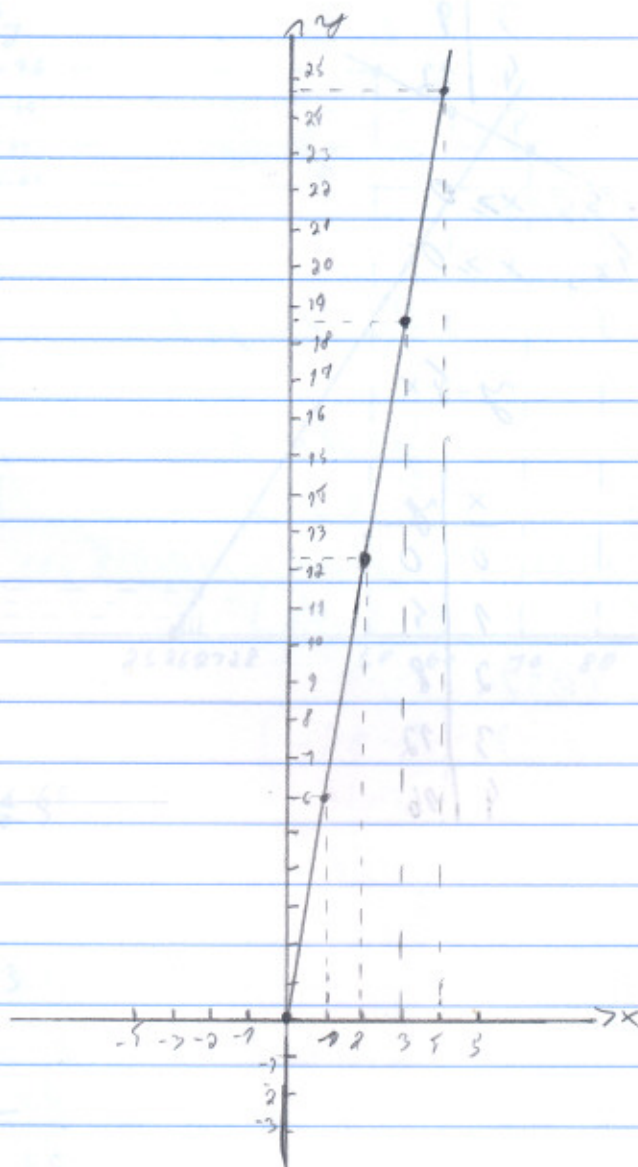
1.3 $y = 10 - 2x$, $x \in [0, 5]$

x	y
0	10
1	8
2	6
3	4
4	2
5	0



1.5 $y = 6,20x$, $x \geq 0$

x	y
0	0
1	6,20
2	12,40
3	18,60
4	24,80



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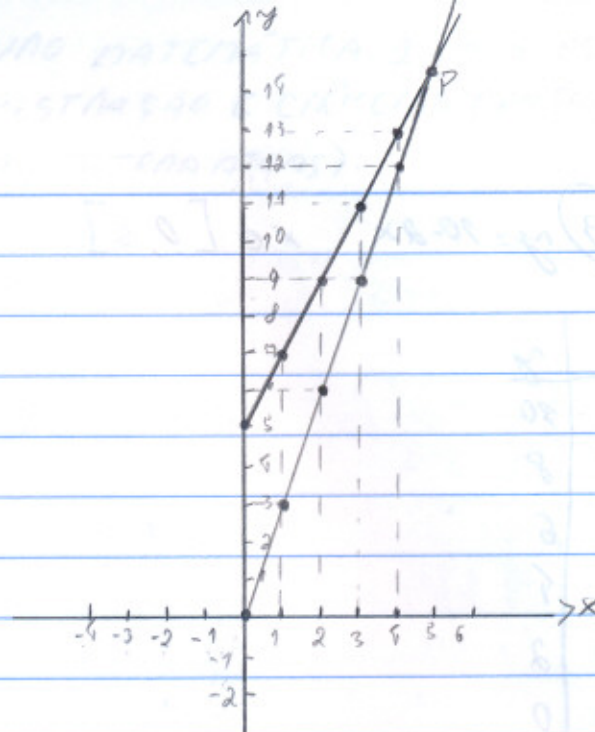
$$\begin{cases} y = 2x + 5, & x \geq 0 \\ y = 3x, & x \geq 0 \end{cases}$$

$$2x + 5$$

$$3x$$

x	y
0	5
1	7
2	9
3	11
4	13

x	y
0	0
1	3
2	6
3	9
4	12



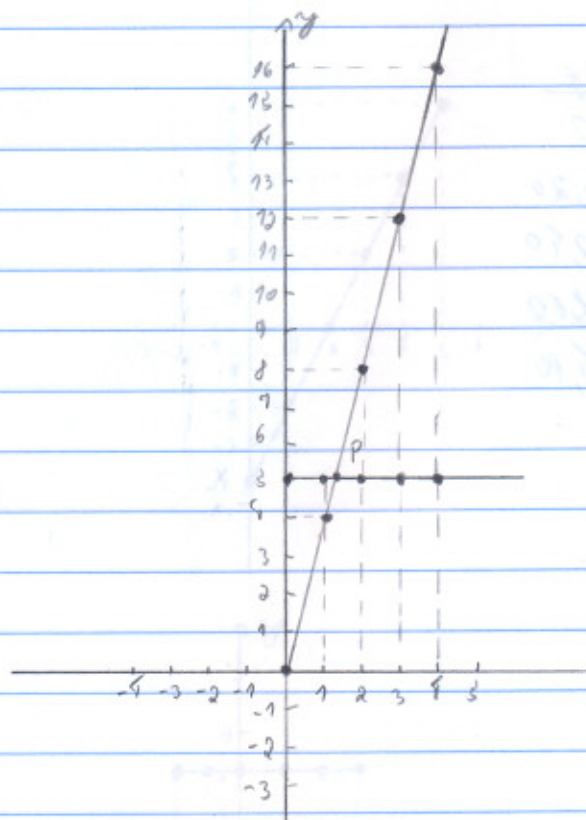
$$\begin{cases} y = 5, & x \geq 0 \\ y = 4x, & x \geq 0 \end{cases}$$

$$y = 5$$

$$y = 4x$$

x	y
0	5
1	5
2	5
3	5
4	5

x	y
0	0
1	4
2	8
3	12
4	16

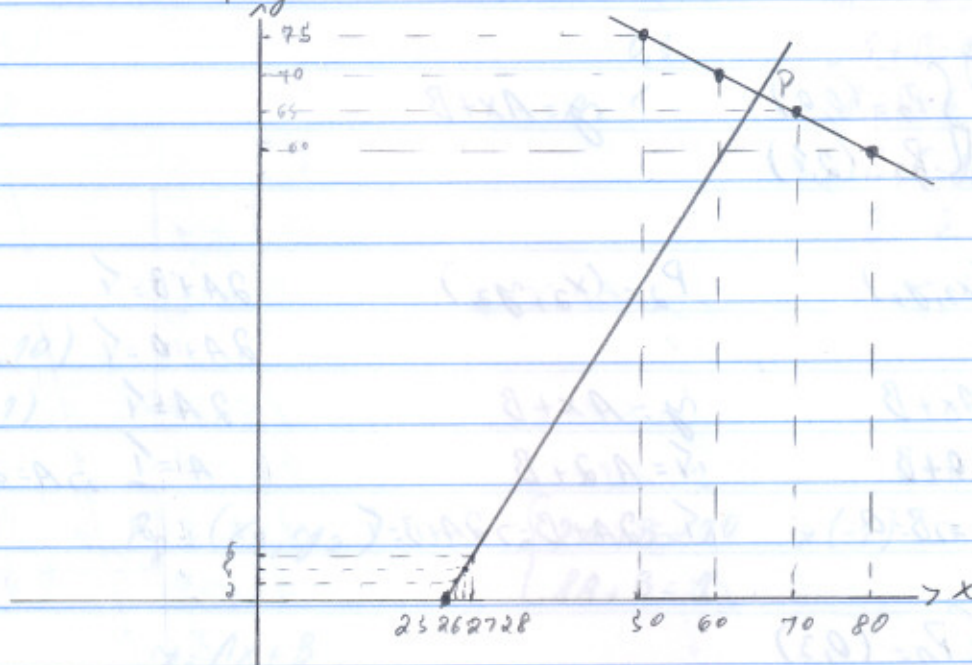


$$2.3 \begin{cases} y = 100 - 0,5x, & 0 \leq x \leq 200 \\ y = 2x - 50, & x \geq 25 \end{cases}$$

$$y = 100 - 0,5x$$

$$y = 2x - 50$$

x	y	x	y
50	75	25	0
60	70	26	2
70	65	27	4
80	60	28	6



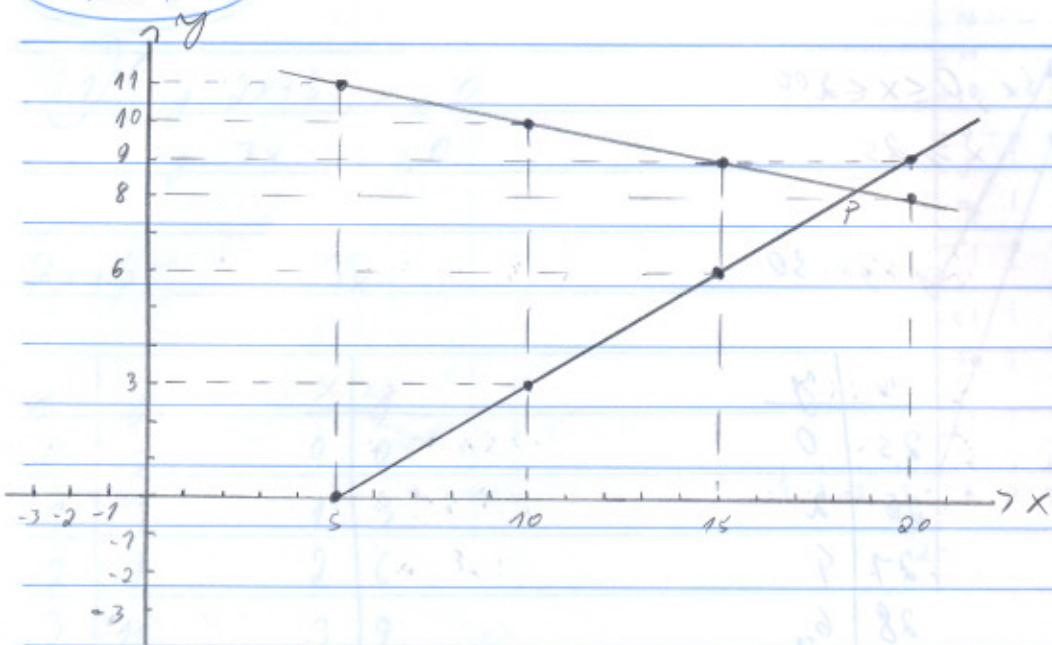
$$2.5 \begin{cases} y = 12 - 0,2x, & 0 \leq x \leq 60 \\ y = 0,6x - 3, & x \geq 5 \end{cases}$$

$$y = 12 - 0,2x$$

$$y = 0,6x - 3$$

x	y	x	y
5	11	5	0
10	10	10	3
15	9	15	6
20	8	20	9

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Ex. 1 $\begin{cases} P_1 = (0, 0) \\ P_2 = (2, 4) \end{cases} \quad y = Ax + B$

$P_1 = (x_1, y_1)$

$P_2 = (x_2, y_2)$

$2A + B = 4$

$y = 2x + 0$

$2A + 0 = 4$

$y = 2x$

$y = Ax + B$

$y = Ax + B$

$2A = 4$

$0 = A \cdot 0 + B$

$4 = A \cdot 2 + B$

$A = \frac{4}{2} \Rightarrow A = 2$

$0 = B \Rightarrow B = 0$

$4 = 2A + B \Rightarrow 2A + B = 4$

2

Ex. 2 $\begin{cases} P_1 = (0, 3) \\ P_2 = (8, 3) \end{cases}$

$P_1 = (x_1, y_1)$

$P_2 = (x_2, y_2)$

$y = 0 \cdot x + 3$

$y = Ax + B$

$y = Ax + B$

$8A + B = 3$

$y = 3$

$3 = A \cdot 0 + B$

$3 = A \cdot 8 + B$

$8A + 3 = 3$

$3 = B$

$3 = 8A + B$

$8A = 3 - 3$

$B = 3$

$8A + B = 3$

$8A = 0$

$A = \frac{0}{8} \Rightarrow A = 0$

$$\textcircled{5.3} \begin{cases} P_1 = (1, 5, 4) \\ P_2 = (2, 6) \end{cases}$$

$$P_1 = (x_1, y_1)$$

$$P_2 = (x_2, y_2)$$

$$\begin{cases} 1,5A + B = 4 \quad \times (-1) \\ 2A + B = 6 \end{cases}$$

$$y = Ax + B$$

$$y = Ax + B$$

$$4 = A(1,5) + B$$

$$6 = A \cdot 2 + B$$

$$\begin{cases} -1,5A + B = -4 \\ 2A + B = 6 \end{cases}$$

$$4 = 1,5A + B$$

$$6 = 2A + B$$

$$1,5A + B = 4$$

$$2A + B = 6$$

$$0,5A = 2$$

$$A = 2$$

$$2A + B = 6$$

$$0,5$$

$$2 \cdot 4 + B = 6$$

$$y = Ax + B$$

$$A = 4$$

$$8 + B = 6$$

$$y = 4x - 2$$

$$B = 6 - 8$$

$$B = -2$$

$$\textcircled{5.5} \begin{cases} P_1 = (2, 10) \\ P_2 = (8, 1) \end{cases}$$

$$P_1 = (x_1, y_1)$$

$$P_2 = (x_2, y_2)$$

$$\begin{cases} 2A + B = 10 \quad \times (-1) \\ 8A + B = 1 \end{cases}$$

$$y = Ax + B$$

$$y = Ax + B$$

$$10 = A \cdot 2 + B$$

$$1 = A \cdot 8 + B$$

$$\begin{cases} -2A - B = -10 \\ 8A + B = 1 \end{cases}$$

$$10 = 2A + B$$

$$1 = 8A + B$$

$$2A + B = 10$$

$$8A + B = 1$$

$$6A = -9$$

$$A = -\frac{9}{6}$$

$$2A + B = 10$$

$$6_2$$

$$2 \left(-\frac{3}{2} \right) + B = 10$$

$$y = Ax + B$$

$$A = -\frac{3}{2}$$

$$y = -\frac{3}{2}x + 13$$

$$2$$

$$-3 + B = 10$$

$$2$$

$$B = 10 + 3$$

$$y = -\frac{3}{2}x + 13$$

$$B = 13$$

1900

$$\text{E.5} \begin{cases} P_1 = (0, 20) \\ P_2 = (12, 0) \end{cases}$$

$$P_1 = (x_1, y_1)$$

$$P_2 = (x_2, y_2)$$

$$y = Ax + B$$

$$20 = A \cdot 0 + B$$

$$20 = 0 + B$$

$$20 = B$$

$$B = 20$$

$$y = Ax + B$$

$$0 = A \cdot 12 + B$$

$$0 = 12A + B$$

$$12A + B = 0$$

$$12A + B = 0$$

$$12A + 20 = 0$$

$$12A = -20$$

$$A = -\frac{20}{12}$$

$$A = -\frac{5}{3}$$

$$A = -\frac{5}{3}$$

$$3$$

$$y = Ax + B$$

$$y = -\frac{5}{3}x + 20$$

$$3$$

$$\text{E.6} \begin{cases} P_1 = (0, 50) \\ P_2 = (8, 0) \end{cases}$$

$$P_1 = (x_1, y_1)$$

$$P_2 = (x_2, y_2)$$

$$y = Ax + B$$

$$50 = A \cdot 0 + B$$

$$50 = 0 + B$$

$$50 = B$$

$$B = 50$$

$$y = Ax + B$$

$$0 = A \cdot 8 + B$$

$$0 = 8A + B$$

$$8A + B = 0$$

$$8A + B = 0$$

$$8A + 50 = 0$$

$$8A = -50$$

$$A = -\frac{50}{8}$$

$$8$$

$$A = -\frac{25}{4}$$

$$4$$

$$y = Ax + B$$

$$y = -\frac{25}{4}x + 50$$

$$4$$

$$\text{E.7} \begin{cases} P = (0, 0) \\ A = 3 \end{cases}$$

$$y = Ax + B$$

$$0 = 3 \cdot 0 + B$$

$$0 = 0 + B$$

$$0 = B$$

$$B = 0$$

$$y = Ax + B$$

$$y = 3x + 0$$

$$y = 3x$$

$$\textcircled{5.2} \begin{cases} P = (3, 5) \\ A = 0,5 \end{cases}$$

$$y = Ax + B$$

$$5 = 0,5 \cdot 3 + B$$

$$5 = 1,5 + B$$

$$1,5 + B = 5$$

$$B = 5 - 1,5$$

$$B = 3,5$$

$$y = Ax + B$$

$$y = 0,5x + 3,5$$

$$\textcircled{5.3} \begin{cases} P = (0, 5) \\ A = -0,2 \end{cases}$$

$$y = Ax + B$$

$$5 = -0,2 \cdot 0 + B$$

$$5 = 0 + B$$

$$5 = B$$

$$B = 5$$

$$y = Ax + B$$

$$y = -0,2x + 5$$

$$\textcircled{5.4} \begin{cases} P = (0, 20) \\ A = 2 \end{cases}$$

$$y = Ax + B$$

$$20 = 2 \cdot 0 + B$$

$$20 = 0 + B$$

$$20 = B$$

$$B = 20$$

$$y = Ax + B$$

$$y = 2x + 20$$

$$\textcircled{5.5} \begin{cases} P = (8, 8) \\ A = -1 \end{cases}$$

$$y = Ax + B$$

$$8 = -1 \cdot 8 + B$$

$$8 = -8 + B$$

$$8 + 8 = B$$

$$16 = B$$

$$B = 16$$

$$\textcircled{5.6} \begin{cases} P = (-2, 1) \\ A = 5 \end{cases}$$

$$y = Ax + B$$

$$1 = 5(-2) + B$$

$$1 = -10 + B$$

$$1 + 10 = B$$

$$11 = B$$

$$B = 11$$

$$\textcircled{6.1} \begin{cases} P_1 = (0, 0) \\ P_2 = (2, 5) \\ P_3 = (3, 8) \\ P_4 = (4, 9) \end{cases}$$

	x	y	x · y	x ²
	0	0	0	0
	2	5	10	4
	3	8	24	9
	4	9	36	16
Σ	9	22	70	29

$$A = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n (\bar{x})^2}$$

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{y} = \frac{\sum y}{n}$$

$$\bar{x} = \frac{9}{4}$$

$$\bar{y} = \frac{22}{4}$$

$$B = \bar{y} - A \bar{x}$$

$$\bar{y} = \frac{11}{2}$$

$$A = \frac{\sum xy - n\bar{x}\bar{y}}{\sum x^2 - n(\bar{x})^2}$$

$$A = \frac{70 - 9 \cdot 9 \cdot 11}{29 - 9 \cdot 9}$$

$$A = \frac{70 - 99}{29 - 81}$$

$$A = \frac{70 - 99}{2}$$

$$A = \frac{70 - 99}{2}$$

$$A = \frac{70 - 99}{2}$$

$$A = \frac{70 - 99}{2}$$

$$A = \frac{70 - 99}{2}$$

$$A = \frac{70 - 99}{2}$$

$$A = \frac{70 - 99}{2}$$

$$A = \frac{70 - 99}{2}$$

$$A = \frac{70 - 99}{2}$$

$$A = \frac{70 - 99}{2}$$

$$B = \bar{y} - A\bar{x}$$

$$B = 11 - 9 \cdot 9$$

$$B = 11 - 81$$

$$B = 11 - 81$$

$$B = 11 - 81$$

$$B = 11 - 81$$

$$B = 11 - 81$$

$$B = 11 - 81$$

$$B = 11 - 81$$

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$$B = 11 - 81$$

$$B = 11 - 81$$

$$B = 11 - 81$$

$$B = 11 - 81$$

$$B = 11 - 81$$

$$B = 11 - 81$$

$$y = Ax + B$$

$$y = 2,3529x + 0,2286$$

$$y = 2,3529x + 0,2286$$

$$y = 2,3529x + 0,2286$$

$$y = 2,3529x + 0,2286$$

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$$y = 2,3529x + 0,2286$$

$$y = 2,3529x + 0,2286$$

1901

6.2

$$\begin{cases} P_1 = (-1, 0) \\ P_2 = (0, 2) \\ P_3 = (1, 3) \\ P_4 = (2, 6) \\ P_5 = (3, 5) \end{cases}$$

$$A = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n (\bar{x})^2}$$

$$B = \bar{y} - A \bar{x}$$

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{y} = \frac{\sum y}{n}$$

	x	y	xy	x ²
	-1	0	0	1
	0	2	0	0
	1	3	3	1
	2	6	12	4
	3	5	15	9
Σ	5	16	30	15

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{y} = \frac{\sum y}{n}$$

$$\bar{x} = \frac{5}{5}$$

$$\bar{y} = \frac{16}{5}$$

$$\bar{x} = 1$$

$$A = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n (\bar{x})^2}$$

$$B = \bar{y} - A \bar{x}$$

$$y = Ax + B$$

$$B = \frac{16}{5} - \frac{7}{5} \cdot 1$$

$$y = \frac{7}{5}x + \frac{9}{5}$$

$$A = \frac{30 - 5 \cdot 1 \cdot \frac{16}{5}}{15 - 5(1)^2}$$

$$B = \frac{16 - 7}{5}$$

$$y = 1,4x + 1,8$$

$$A = \frac{30 - 16}{15 - 5(1)}$$

$$B = \frac{9}{5}$$

$$A = \frac{14}{10}$$

$$A = \frac{7}{5}$$

$$A = \frac{7}{5}$$

6.3

$$P_1 = (0, 20)$$

$$P_2 = (2, 12)$$

$$P_3 = (5, 7)$$

$$P_4 = (6, 3)$$

$$P_5 = (8, 0,5)$$

$$A = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n (\bar{x})^2}$$

$$B = \bar{y} - A \bar{x}$$

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{y} = \frac{\sum y}{n}$$

	x	y	x·y	x ²
	0	20	0	0
	2	12	24	4
	5	7	35	25
	6	3	18	36
	8	0,5	4	64
Σ	20	42,5	79	120

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{y} = \frac{\sum y}{n}$$

$$\bar{x} = \frac{20}{5}$$

$$\bar{y} = \frac{42,5}{5}$$

$$\bar{x} = 4$$

$$A = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n (\bar{x})^2}$$

$$B = \bar{y} - A \bar{x}$$

$$y = Ax + B$$

$$B = \frac{42,5}{5} - \left(-\frac{12}{5} \cdot 4 \right)$$

$$y = -\frac{12}{5}x + \frac{90,5}{5}$$

$$A = \frac{79 - 5 \cdot 4 \cdot 8,5}{120 - 5(4)^2}$$

$$B = \frac{42,5}{5} - \left(-\frac{48}{5} \right)$$

$$y = -2,4x + 18,1$$

$$A = \frac{79 - 170}{120 - 80}$$

$$B = \frac{42,5}{5} + \frac{48}{5}$$

$$A = \frac{-96}{40}$$

$$B = \frac{90,5}{5}$$

$$A = -\frac{96}{40}$$

$$A = -\frac{12}{5}$$

19061

6.5

$$P_1 = (1, 20)$$

$$P_2 = (3, 50)$$

$$P_3 = (10, 70)$$

$$P_4 = (13, 90)$$

$$A = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n (\bar{x})^2}$$

$$B = \bar{y} - A \bar{x}$$

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{y} = \frac{\sum y}{n}$$

x	y	xy	x ²	$\bar{x} = \frac{\sum x}{n}$	$\bar{y} = \frac{\sum y}{n}$
1	20	20	1	$\bar{x} = \frac{31}{4}$	$\bar{y} = \frac{220}{4}$
3	50	150	9		
10	70	700	100		
13	90	1170	169		
$\sum$	31	220	2.270	31	55

$$A = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n (\bar{x})^2}$$

$$B = \bar{y} - A \bar{x}$$

$$y = Ax + B$$

$$B = 55 - \frac{2.260}{4} \cdot \frac{31}{4}$$

$$y = \frac{2.260}{4}x + \frac{6.850}{4}$$

$$A = \frac{2.270 - 4 \cdot \frac{31}{4} \cdot 55}{31 - 4 \left(\frac{31}{4} \right)^2}$$

$$B = 55 - \frac{17.515}{4}$$

$$y = 3,1016x + 15,4628$$

$$A = \frac{2.270 - 1.705}{31 - 1.961}$$

$$B = \frac{6.850}{4}$$

$$A = \frac{565}{31 - 961}$$

$$A = \frac{565}{1.901 - 961}$$

$$A = \frac{565}{4} \Rightarrow A = 565 \cdot \frac{1}{4} \Rightarrow A = \frac{2.260}{4}$$