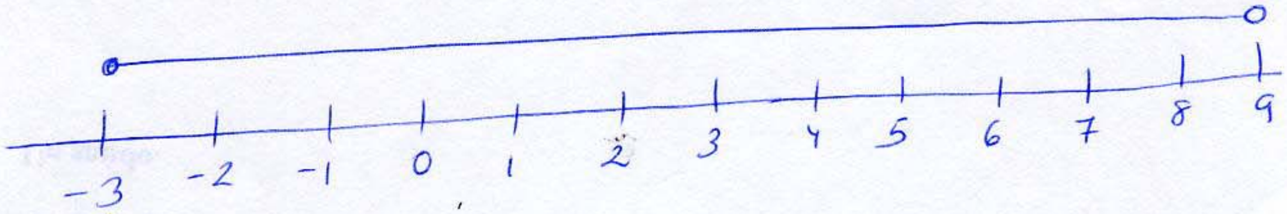
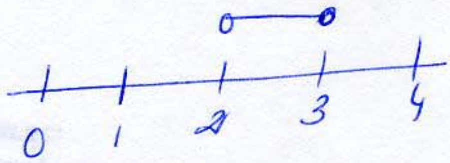
1) a) $A=[-3,9)$

$A=\{x\in\mathbb{R} \,/\, -3\le x<9\}$

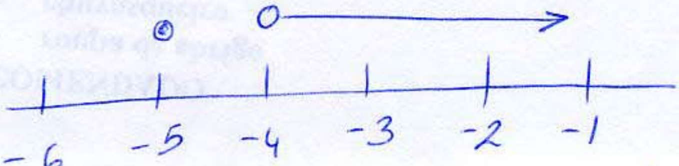


b) $B=\{x\in\mathbb{R} \,/\, 2<x\le -3\}$



$B=(2,3]$

c)



$(-4,\infty)$

Dev $C=\{x\in\mathbb{R} \,/\, x>-4\}$

2) $$\frac{\sqrt{x^7\sqrt[4]{y^6}}\;\sqrt[3]{x^4}}{\sqrt[6]{y^5\sqrt{y^3\cdot x}}} = \frac{x^{\frac{7}{2}}\,y^{\frac{6}{8}}\,x^{\frac{4}{3}}}{y^{\frac{5}{6}}\,y^{\frac{3}{12}}\,x^{\frac{1}{12}}} = \frac{x^{\frac{7}{2}+\frac{4}{3}}\;y^{\frac{6}{8}=\frac{3}{4}}}{y^{\frac{5}{6}+\frac{3}{12}}\;x^{\frac{1}{12}}} =$$

$$= \frac{x^{\frac{21+8}{6}}\;y^{\frac{3}{4}}}{y^{\frac{10+3}{12}}\;x^{\frac{1}{12}}} = \frac{x^{\frac{29}{6}}\;y^{\frac{3}{4}}}{y^{\frac{13}{12}}\;x^{\frac{1}{12}}} = x^{\frac{29}{6}-\frac{1}{12}}\;y^{\frac{3}{4}-\frac{13}{12}} =$$

$$= x^{\frac{58-1}{12}}\;y^{\frac{9-13}{12}} = x^{\frac{57}{12}}\;y^{\frac{-4}{12}=\frac{-1}{3}} = \frac{x^{\frac{57}{12}}}{y^{+\frac{1}{3}}} = \frac{\sqrt[12]{x^{57}}}{\sqrt[3]{y}}$$

③ a) $5\sqrt[3]{2} + \sqrt[3]{54} - \sqrt[3]{250} =$

$$\begin{array}{r|l} 54 & 2 \\ 27 & 3 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array} \qquad \begin{array}{r|l} 250 & 2 \\ 125 & 5 \\ 25 & 5 \\ 5 & 5 \\ 1 & \end{array}$$

$$= 5\sqrt[3]{2} + \sqrt[3]{2\cdot 3^3} - \sqrt[3]{2\cdot 5^3} =$$

$$= 5\sqrt[3]{2} + \sqrt[\cancel{3}]{3^{\cancel{3}}}\cdot\sqrt[3]{2} - \sqrt[3]{2}\cdot\sqrt[\cancel{3}]{5^{\cancel{3}}} =$$

$$= \cancel{5\sqrt[3]{2}} + 3\sqrt[3]{2} - \cancel{5\sqrt[3]{2}} = \underline{\underline{3\sqrt[3]{2}}}$$

b) $\sqrt{28} + \sqrt{63} + 3\sqrt{7} - 2\sqrt{700} =$

$$\begin{array}{r|l} 28 & 2 \\ 14 & 2 \\ 7 & 7 \\ 1 & \end{array} \qquad \begin{array}{r|l} 63 & 7 \\ 9 & 3 \\ 3 & 3 \\ & \end{array} \qquad \begin{array}{r|l} 700 & 2 \\ 350 & 2 \\ 175 & 5 \\ 35 & 5 \\ 7 & 7 \\ 1 & \end{array}$$

$$= \sqrt{2^2\cdot 7} + \sqrt{3^2\cdot 7} + 3\sqrt{7} - 2\sqrt{7\cdot 5^2\cdot 2^2}$$

$$= \sqrt{\cancel{2^2}}\cdot\sqrt{7} + \sqrt{\cancel{3^2}}\cdot\sqrt{7} + 3\sqrt{7} - 2\sqrt{\cancel{5^2}}\sqrt{\cancel{2^2}}\sqrt{7} =$$

$$= 2\sqrt{7} + 3\sqrt{7} + 3\sqrt{7} - 2\cdot 5\cdot 2\sqrt{7} =$$

$$= 2\sqrt{7} + 3\sqrt{7} + 3\sqrt{7} - 20\sqrt{7} = \underline{\underline{-12\sqrt{7}}}$$

④ a) $(7^4)^{-3} = 7^{-12} = \dfrac{1}{7^{12}}$ //

b) $\dfrac{2^{-1}(2^5)^{-3}\cdot 2}{2^{-7}} = \dfrac{2^{-1}\cdot 2^{-15}\cdot 2}{2^{-7}} = \dfrac{2^{-15}}{2^{-7}} = 2^{-8} = \dfrac{1}{2^8}$ //

c) $\left(\dfrac{1}{\sqrt{2}}\right)^{-4} = (\sqrt{2})^4 = 2^{\frac{4}{2}} = 2^2$ //

⑧ a) $405,\ 270,\ 180,\ 120$ $\quad \times \frac{1}{1'5} = \times 0'6$

$405 \xrightarrow{\times 0'6} 270 \quad 270 \xrightarrow{\times 0'6} 180$

<u>Sucesión geométrica</u>

$$a_n = a_1 \cdot r^{n-1} \Rightarrow a_n = 405 \cdot \left(\frac{1}{1'5}\right)^{n-1}$$

$$a_{20} = 405 \cdot \left(\frac{1}{1'5}\right)^{20-1} = 405 \left(\frac{1}{1'5}\right)^{19} = 0'183\ldots$$

$$S_n = \frac{a_1(r^n - 1)}{r-1} \rightarrow S_{12} = \frac{405\left(\left(\frac{1}{1'5}\right)^{12} - 1\right)}{\frac{1}{1'5} - 1} = \frac{-405}{-0'\overline{3}} =$$

$$= \frac{-405}{-0'\overline{3}} = 1215'0$$

b) $4, 15, 26, 37, \ldots$ $\quad (15 \xrightarrow{+11} 26)$ $\quad$ Sucesión aritmética

$$b_n = b_1 + (n-1)\cdot d \quad \begin{cases} b_1 = 4 \\ d = +11 \end{cases} \quad b_n = 4 + (n-1)\cdot(+11) \rightarrow$$

$$\rightarrow b_n = 4 + 11n - 11 = 11n - 7 \qquad \boxed{b_n = 11n - 7}$$

$$b_{20} = 11 \cdot 20 - 7 = 213 \qquad b_{12} = 11 \cdot 12 - 7 = 125$$

$$S_{12} = \frac{(b_1 + b_{12}) \cdot 12}{2} = \frac{(4+125)\cdot 12}{2} = \underline{774}$$

(9) $j_n = 2\cdot j_{n-2} + 3\, j_{n-1}$

$j_1 = -1$

$j_2 = 0$

$j_3 = 2\, j_{3-2} + 3\, j_{3-1} = 2\cdot j_1 + 3\, j_2 = 2\cdot(-1) + 3\cdot 0 = -2$

$j_4 = 2\, j_{4-2} + 3\, j_{4-1} = 2\, j_2 + 3\, j_3 = 2\,(0) + 3\cdot(-2) = -6$

$j_5 = 2\, j_{5-2} + 3\, j_{5-1} = 2\, j_3 + 3\, j_4 = 2\,(-2) + 3\,(-6) = -22$

$j_6 = 2\, j_{6-2} + 3\, j_{6-1} = 2\, j_4 + 3\, j_5 = 2(-6) + 3\,(-22) = -78$

(10)

$$\begin{array}{ccccc} & i & & d & \\ 12\,h/d & \longrightarrow & 10d & \longrightarrow & 600c \\ 8\,h/d & \longrightarrow & x & \longrightarrow & 200c \\ & & d & & \end{array}$$

$$\frac{12\cdot 10}{8\cdot x} = \frac{600}{200} \Rightarrow 8\,x\cdot 600 = 200\cdot 12\cdot 10$$

$$x = \frac{200\cdot 12\cdot 10}{600\cdot 8} = \underline{5\,\text{dias}}$$

(11) $a_m = a_1 + (m-1) \cdot d$

$a_2 = a_1 + (2-1) \cdot d = a_1 +$ $\quad$ $\left.\begin{array}{l} 17 = a_1 + d \\ 50 = a_1 + 4d \end{array}\right\}$

$a_5 = a_1 + (5-1) \cdot d$

$a_1 = 17 - d$

$a_1 = 50 - 4d$

$17 - d = 50 - 4d$

$4d - d = 50 - 17$

$3d = 33$ $\quad$ $d = \frac{33}{3} = 11$

$d = 11 \Rightarrow a_1 = 17 - 11 = 6$

$a_m = 6 + (m-1) \cdot 11 = 6 + 11m - 11 = 11m - 5$

$a_m = 11m - 5 \Rightarrow a_{12} = 11 \cdot 12 - 5 = \underline{127}$