Lista de Exercícios 1 - 21-03-24

① a) $|2-\pi| = \boxed{-2+\pi}$ ✓

b) $|x-5|$ se $x > 5 = \boxed{x-5}$ ✓

c) $|x+6|$ se $x < -6 = -(x+6) = \boxed{-x-6}$ ✓

d) $-|\sqrt{2}-1,4| = -(\sqrt{2}-1,4) = \boxed{-\sqrt{2}+1,4}$ ✓

② $\frac{2}{m(m+1)} + \frac{3}{m^2} : \left(\frac{2}{\frac{m+1}{m}} + \frac{3}{m^2}\right) : \frac{2m}{m+1} + \frac{3}{m^2} : \frac{2m+3.(m+1)}{m^2(m+1)} = \boxed{\frac{5m+3}{m^2(m+1)}}$ ✓

↳ subtração

③ a) $\frac{(m+1)}{2} + \frac{3}{m} = \frac{m(m+1)+6}{2m} = \boxed{\frac{mm+m+6}{2m}}$ ✓

b) $\frac{2}{5} \cdot \frac{m+3}{7} + \frac{1}{2} = \frac{2(m+3)}{35} + \frac{1}{2}$

$\frac{4m+12+35}{70} = \boxed{\frac{4m+47}{70}}$ ✓

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

$(n+1).(n-2) = n^2-2n+n-2$

$\frac{3n^2+n^2-2n+n-2}{n^3(n-2)} = \boxed{\frac{4n^2-n-2}{n^3(n-2)}}$ ✓

④ a) $(x+y+z)^2 = (x+y+z).(x+y+z) = x^2+y^2+z^2+2xy+2xz+2yz$ ✓

b) $xy(x+y)\left(\frac{1}{x}+\frac{1}{y}\right) = x^2y+xy^2\left(\frac{1}{x}-\frac{1}{y}\right) = xy-x^2+y^2-xy = \boxed{y^2-x^2}$ ✓

c) $(m+3)(m^2-3m+9) = (m^2-3m+9).(m+3) = \boxed{m^3+27}$ ✓

⑤ $|2x-6| = 11$

a) 1^a $2x-6 = 11$ $\quad 2^a$ $2x-6 = -11$

$+11 \quad +11$

$2x = 11+6 \quad 2x = -11+6$

$\boxed{x = 17/2} \quad \boxed{x = \frac{-5}{2}}$ ✓

b) $\left|\frac{x+1}{x-2}\right| = 2$ $\quad -2$

$+2$

$1^a) \; x+1 = 2x-2 \quad 2^a) \; x+1 = -2x+4$

$+2x \quad +x = -2-1 \quad -3x = 3$

$\boxed{x = -3} \quad \boxed{x = 3/-3}$ ✓

$\boxed{x = -1}$

c) $|x+3| + |x-4| = 9$

$p/ x < -3$	$p/ -3 \le x \le 4$	$p/ x > 4$
$\|x+3\| < 0$	$\|x+3\| > 0$	$\|x+3\| > 0,\ \|x-4\| > 0$
$\|x-4\| < 0$	$\|x-4\| < 0$	$x+3+x-4 = 9$
$-x+3-x-4 = 9$	$x+3-x+4 = 9$	$2x = 9+1$
$-2x = 10$	$7 = 9$	$x = 10/2$
$x = 10/-2$	absurdo.	$\boxed{x = 5}$ ✓
$\boxed{x = -5}$		

⑥ a) $\{x : |x-4| < 1/10\}$

$-\frac{1}{10} < x-4 < \frac{1}{10}$

$-\frac{1}{10}+4 < x < \frac{1}{10}+4$ ∴ $\frac{-39}{10} < x < \frac{41}{10}$ ∴ $]-\frac{39}{10}, \frac{41}{10}[$ ✓

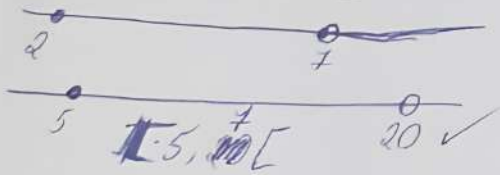
b) $\{x : |x+4| < 3/2\}$

$-\frac{3}{2} < x+4 < \frac{3}{2}$

$-\frac{3}{2} - 4 < x < \frac{3}{2} - 4$ $\quad]-11/2, -5/2[$ ✓

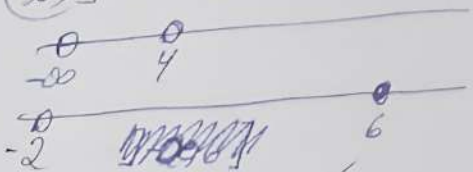
$-11/2 < x < -5/2$

⑦ a) $[2, 7[\cap [5, 20[$



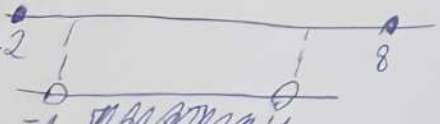
$[5, 7[$ ✓

b) $]-\infty, 4[\cap]-2, 6]$



$]-2, 4[$ ✓

c) $[-2, 8] \cap]-1, 4[$



$]-1, 4[$ ✓

⑧ a) $\frac{x^{p+q}}{x^{p-q}} = \frac{x^p \cdot x^q}{\frac{x^p}{x^q}}$ $\quad x^p x^q \left(\frac{x^q}{x^p}\right) = x^{q+q} = x^{2q}$ ✓

b) $(x^{n+1})^2 (x^{n-1})^2$

c) $x^{-3} y^5 - 3x^{-4} y^6 = \frac{y^5}{x^3} - \frac{3y^6}{x^4} =$

$\boxed{\frac{xy^5 - 3y^6}{x^4}}$ ✓