NOME: FELIPE ARCHANJO DA CUNHA MENDES

RA: 2252740

1. $(x^{-1} + y^{-1}) = 2$

$\left(\frac{1}{x} + \frac{1}{y}\right) = 2 \therefore \frac{y + x}{xy} = 2 \therefore x + y = 2xy$

$\boxed{\begin{matrix} x \neq 0 \\ y \neq 0 \end{matrix}}$

$\therefore x + y - 2xy = 0$

$\therefore x + y(1 - 2x) = 0$

$\therefore y = \frac{-x}{1 - 2x} \therefore y = \frac{-x}{-(2x - 1)}$

$\therefore \boxed{y = \frac{x}{2x - 1}}$ //

C.E: $2x - 1 \neq 0 \therefore 2x \neq 1$

$\therefore \boxed{x \neq 1/2}$

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

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

$= \frac{1}{\frac{9}{16}} = \boxed{\frac{16}{9}}$ ///

3. $\dfrac{2^{n+4}+2^{n+2}+2^{n-1}}{2^{n-2}+2^{n-1}} = \dfrac{\cancel{2^n}(2^4+2^2+2^{-1})}{\cancel{2^n}(2^{-2}+2^{-1})}$

$= \dfrac{16+4+1/2}{\frac{1}{4}+\frac{1}{2}} = \dfrac{20+1/2}{\frac{1}{4}+\frac{2}{4}} = \dfrac{20+1/2}{\frac{3}{4}}$

$\dfrac{4(20+1/2)}{3} = \dfrac{80+2}{3} = \boxed{\dfrac{82}{3}}$

4. $\dfrac{mx+m-x-1}{m^2-1} = \dfrac{x(m-1)+(m-1)}{(m+1)(m-1)}$ $m \neq 1$ $m \neq -1$

$= \dfrac{\cancel{(m-1)}(x+1)}{(m+1)\cancel{(m-1)}} = \boxed{\dfrac{x+1}{m+1}}$

$m \neq -1$

5. $(4-h)x+3(5-2h)+6h=0$

$(4-h)(-1)+3(5-2h)+6h=0$

$h-4+15-\cancel{6h}+\cancel{6h}=0$

$h+11=0$

$\boxed{h=-11}$

6. $x-8<2+4x<7x+8$

* $x-8<2+4x$

$-8-2<4x-x$

$-10<3x$

$x>-10/3$

* $2+4x<7x+8$

$2-8<7x-4x$

$-6<3x$

$x>-2$

$S =]-2, +\infty[$

7. $\frac{ax-2}{5} < \frac{7}{2} \therefore a(x-2) < \frac{35}{2}$

$\therefore ax < \frac{35}{2} + 2$

$\therefore ax < \frac{35}{2} + \frac{4}{2}$

$\therefore ax < \frac{39}{2} \therefore x < \frac{39}{2a}, \ a > 0$

$$\boxed{S = \left]-\infty, \frac{39}{2a}\right[, \ a > 0}$$