1. $|2x-1| = 1$

$2x - 1 = 1$ ou $2x - 1 = -1$

$2x = 2$ ou $2x = 0$

$\boxed{x = 1 \quad \text{ou} \quad x = 0}$

2. $\dfrac{x-1}{2} + \dfrac{x}{3} \geq 4$

Multiplicar 6 aos dois lados da inequação

$6 \cdot \dfrac{x-1}{2} + 6 \cdot \dfrac{x}{3} \geq 6 \cdot 4$

$3(x-1) + 2x \geq 24$

$3x - 3 + 2x \geq 24$

$5x \geq 27$

$x \geq \dfrac{27}{5}$

O conjunto solução $S = \{ x \in \mathbb{R} \mid x \geq \frac{27}{5} \} = \boxed{\left[\frac{27}{5}, +\infty\right)}$

3. $D_f = \{ x \in \mathbb{R} \mid -3 \leq x \leq 3 \} = [-3, 3] = A$

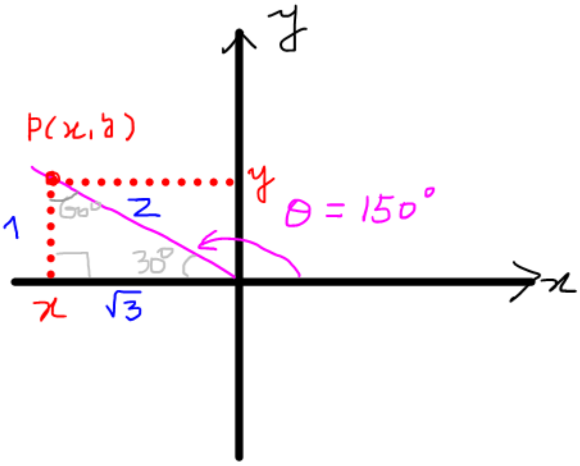
$Im_f = \{ y \in \mathbb{R} \mid -2 \leq y \leq 2 \} = [-2, 2] = B$

Como $f : A \to B$, implica que $f^{-1} : B \to A$

Logo

$$\boxed{\begin{array}{l} D_{f^{-1}} = \{ x \in \mathbb{R} \mid -2 \leq x \leq 2 \} = [-2, 2] \\ Im_{f^{-1}} = \{ y \in \mathbb{R} \mid -3 \leq y \leq 3 \} = [-3, 3] \end{array}}$$

4. $\theta = \frac{5\pi}{6} = 150^\circ$



Podemos supor $x = -\sqrt{3}$, $y = 1$ e $r = 2$

$$\operatorname{sen} \frac{5\pi}{6} = \frac{y}{r} = \frac{1}{2}$$

$$\cos \frac{5\pi}{6} = \frac{x}{r} = \frac{-\sqrt{3}}{2}$$

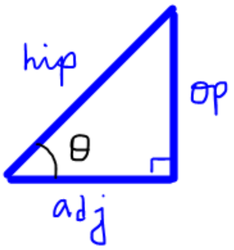
$$\operatorname{tg} \frac{5\pi}{6} = \frac{y}{x} = \frac{1}{-\sqrt{3}} = -\frac{\sqrt{3}}{3}$$

$$\operatorname{cossec} \frac{5\pi}{6} = \frac{r}{y} = \frac{2}{1} = 2$$

$$\sec \frac{5\pi}{6} = \frac{r}{x} = \frac{2}{-\sqrt{3}} = -\frac{2\sqrt{3}}{3}$$

$$\operatorname{cotg} \frac{5\pi}{6} = \frac{x}{y} = \frac{-\sqrt{3}}{1} = -\sqrt{3}$$

5. $\operatorname{tg}\theta = 2$, $0 < \theta < \frac{\pi}{2}$



$$\operatorname{tg}\theta = \frac{op}{adj} = 2 = \frac{2}{1}$$

Podemos supor $op = 2$ e $adj = 1$

Pelo Teorema de Pitágoras,

$$hip^2 = op^2 + adj^2$$

$$hip^2 = 2^2 + 1^2 = 4 + 1 = 5$$

$$hip = \sqrt{5}$$

Assim

$$\operatorname{sen}\theta = \frac{op}{hip} = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$$

$$\cos\theta = \frac{adj}{hip} = \frac{1}{\sqrt{5}} \quad \frac{\sqrt{5}}{5}$$

$$\operatorname{cossec}\theta = \frac{1}{\operatorname{sen}\theta} = \frac{\sqrt{5}}{2}$$

$$\sec\theta = \frac{1}{\cos\theta} = \frac{\sqrt{5}}{1} = \sqrt{5}$$

$$\operatorname{cotg}\theta = \frac{1}{\operatorname{tg}\theta} = \frac{1}{2}$$

6. (a) $\sec(\operatorname{arctg} 1) = ?$

$\operatorname{arctg} 1 = \frac{\pi}{4}$ pois $\operatorname{tg}\frac{\pi}{4} = 1$

Logo $\sec(\operatorname{arctg} 1) = \sec\left(\frac{\pi}{4}\right) = \frac{1}{\cos\frac{\pi}{4}} = \frac{1}{\frac{1}{\sqrt{2}}} = \boxed{\sqrt{2}}$

(b) $\operatorname{arctg}\sqrt{3} = ?$

$\operatorname{artg}\sqrt{3} = \boxed{\frac{\pi}{3}}$ pois $\operatorname{tg}\frac{\pi}{3} = \sqrt{3}$

7. $2^{\log_2 3 + \log_2 5} = 2^{\log_2 15} = \boxed{15}$