P1: 13, 20, 21, 39
P2: 24, 32

P1

13. $-2x > 4 \Rightarrow x < -2$, $x \in (-\infty, -2)$

20. $\frac{x+1}{x} \geq 2 \Rightarrow$ OR
$x+1 \geq 2x \wedge x > 0 \Rightarrow 0 < x \leq 1$
$x+1 \leq 2x \wedge x < 0 \Rightarrow x < 0$ and $x \geq 1$ ↯
↳ impossible

$\Rightarrow 0 < x \leq 1$, $x \in (0, 1]$

Note that $x = 0$ is not possible, since x is in the denominator in the original expression $\frac{x+1}{x}$.

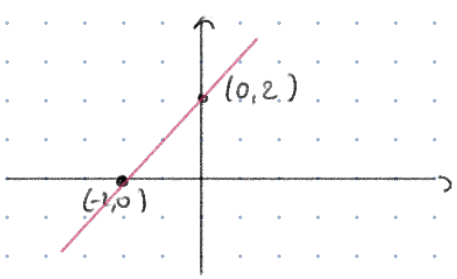
21. $x^2 - 2x \leq 0 \Leftrightarrow x(x-2) \leq 0 \Rightarrow x - 2 < 0$ and $x > 0 \Rightarrow 0 \leq x \leq 2$
↳ both factors need to have different sign.

$x \in [0, 2]$

39. $\left|\frac{x}{2} - 1\right| \leq 1 \Leftrightarrow |x-2| \leq 2 \Leftrightarrow -2 \leq x-2 \leq 2$
$\Leftrightarrow 0 \leq x \leq 4$ $x \in [0, 4]$

P2. 24

equation of the line through $(-2, 0)$ and $(0, 2)$



$y = mx + b$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0-2}{-2-0} = 1$

$0 = 1 \cdot (-2) + b \Rightarrow b = 2$

solution: $y = x + 2$

32. equation of the line through $(-2,2)$

(a) parallel to $2x+y=4 \iff y=4-2x$

$\rightarrow m=-2$

$\rightarrow 2=(-2)(-2)+b \Rightarrow b=-2$

solution : $y=-2x-2$ (or $y+2x=-2$)

(b) perpendicular to $2x+y=4 \iff y=4-2x$

$\rightarrow m=-\frac{1}{-2}=+\frac{1}{2}$

$\rightarrow 2=\frac{1}{2}(-2)+b \Rightarrow 3$

solution : $y=\frac{x}{2}+3$ (or $2y-x=6$)