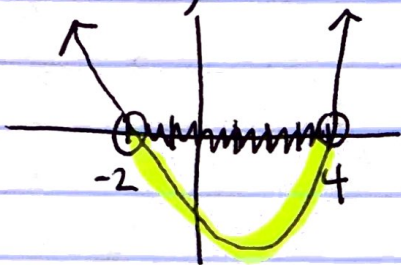


# POLYNOMIAL INEQUALITIES

Find and graph the solution set.

①  $(x-4)(x+2) < 0$

roots: 4, -2



↑ What  $x$ -values are when ~~are~~  $y$ -values negative?

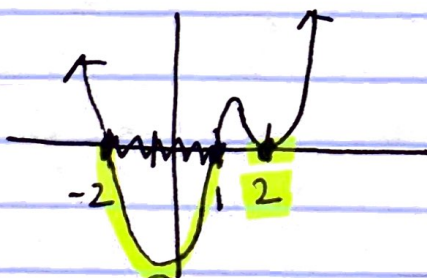
$$\{x \mid -2 < x < 4\}$$

- \* Make one side 0
- \* Factor completely
- \* Graph
- \* Determine soln

②  $(x^2 + x - 2)(x^2 - 4x + 4) \leq 0$   
 $(x-1)(x+2)(x-2)(x-2) \leq 0$

roots: -2, 1, 2 DR

↓ STATE  $x$  that gives negative  $y$ -values and where  $y=0$

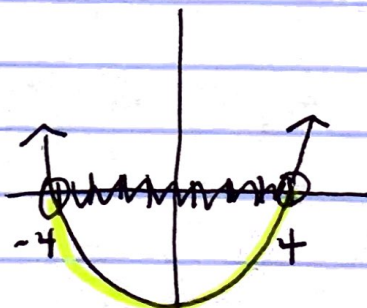


$$\{x \mid -2 \leq x \leq 1, x=2\}$$

③  $3x^2 < 48$   
 $3x^2 - 48 < 0$   
 $3(x^2 - 16) < 0$   
 $3(x+4)(x-4) < 0$

↓  
 $3 \neq 0$

roots: -4, 4



$$\{x \mid -4 < x < 4\}$$

$$\textcircled{4} \quad x+1 < (x+1)(x-1) \rightarrow 0 < (x+1)(x-1) - x - 1$$

$$x+1 < x^2 - 1$$

$$-x^2 + x + 2 < 0$$

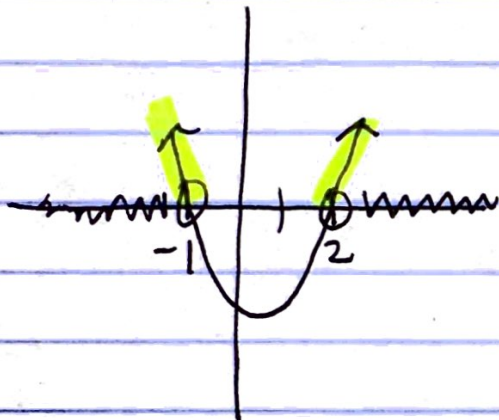
$$0 < x^2 - 1 - x - 1$$

$$0 < x^2 - x - 2$$

$$\frac{-1(x^2 - x - 2) < 0}{-1}$$

$$x^2 - x - 2 > 0$$

$$x^2 - x - 2 > 0 \quad (x+1)(x-2) > 0$$



$$\{x \mid x < -1 \text{ or } x > 2\}$$