POLYNOMIAL INEQUALITIES

1. GET EVERYTHING ON LEFT SIDE, ZERO ON RIGHT SIDE
2. FACTOR LEFT SIDE
3. SET EACH FACTOR EQUAL TO ZERO AND SOLVE "CRITICAL VALUES"
4. BUILD A TABLE OF INTERVALS WITH CRITICAL VALUES, USE GRAPH AND X-AXIS TO DETERMINE ANSWER

$<$ or $\leq$: ANSWER IS BELOW X-AXIS

$>$ or $\geq$: ANSWER IS ABOVE X-AXIS

$<$ or $>$: PARENTHESIS

$\leq$ or $\geq$: BRACKETS

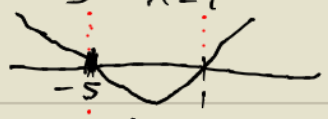
#1 ① $x^2+4x-5<0$

PSD ② $(x+5)(x-1)<0$

③ $x+5=0$ $x-1=0$

$x=-5$ $x=1$

④



$(-5,1)$

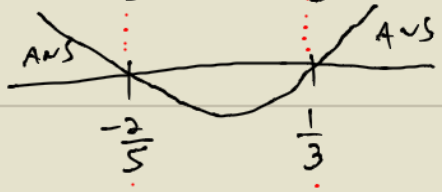
#2 $15x^2+x-2\geq 0$

② $(5x+2)(3x-1)\geq 0$

③ $5x+2=0$ $3x-1=0$

$5x=-2$ $3x=1$

$x=\frac{-2}{5}$ $x=\frac{1}{3}$



$(-\infty, \frac{-2}{5}] \cup [\frac{1}{3}, \infty)$

#3 $x^2 \leq 3x+3$

$x^2-3x-3\leq 0$

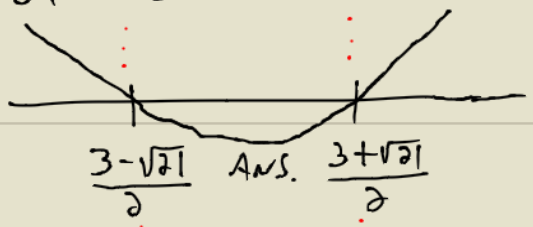
$a=1$ $b=-3$ $c=-3$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$\frac{-(-3)\pm\sqrt{(-3)^2-4(1)(-3)}}{2(1)}$

$=\frac{3\pm\sqrt{9+12}}{2}$

$=\frac{3\pm\sqrt{21}}{2}$



$\left[\frac{3-\sqrt{21}}{2}, \frac{3+\sqrt{21}}{2}\right]$

#4

$x^3+7x^2-4x-28<0$

$x^2(x+7)-4(x+7)<0$

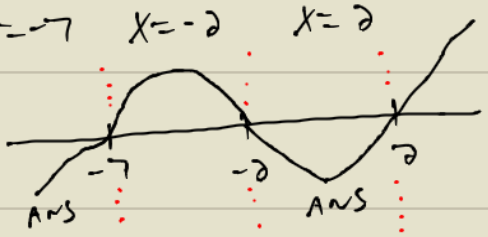
$(x+7)(x^2-4)<0$

DOTS

$(x+7)(x+2)(x-2)<0$

$x+7=0$ $x+2=0$ $x-2=0$

$x=-7$ $x=-2$ $x=2$



$(-\infty,-7)\cup(-2,2)$