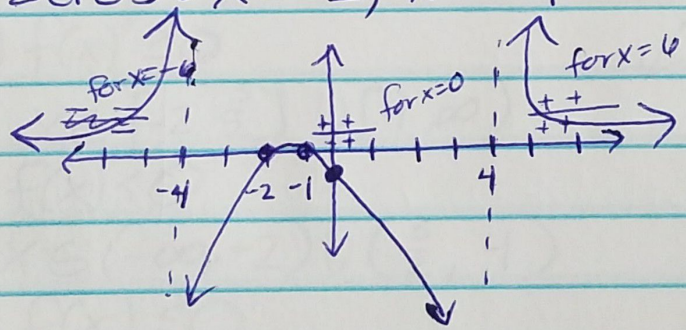
2.8 Solving Inequalities in One Variable

① Solve one side of the inequality for zero
② Determine the zeros, VA/holes of the inequality (remember to factor!)
③ Make a very rough sketch of the graph
④ Use the graph to determine the interval solution.

Ex #1 Solve $f(x)=\frac{x^2+3x+2}{x^2-16}$ for a) undef. vals.
b) $=0$ c) >0 d) ≥ 0 e) <0 f) ≤ 0.

$$\frac{(x+2)(x+1)}{(x-4)(x+4)}=0$$

a) undef: $x=4$ & $x=-4$
b) zeros: $x=-2$, $x=-1$



c) $f(x)>0$ $\quad x\in(-\infty,-4)\cup(-2,-1)\cup(4,\infty)$
d) $f(x)\geq 0$ $\quad x\in(-\infty,-4)\cup[-2,-1]\cup(4,\infty)$
e) $f(x)<0$ $\quad x\in(-4,-2)\cup(-1,4)$
f) $f(x)\leq 0$ $\quad x\in(-4,-2]\cup[-1,4)$

Ex #2 Solve for when $f(x) = 2x^3 - 7x^2 - 10x + 24$ is a) $=0$ b) >0 c) ≥ 0 d) <0 e) ≤ 0.

a) $0 = 2x^3 - 7x^2 - 10x + 24$

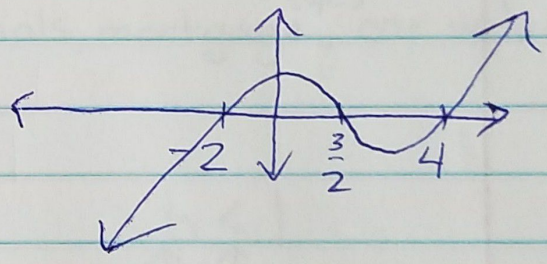
$P/q = \pm \frac{1, 24, 3, 8, 2, 12, 6, 4,}{1, 2}$

-2	2	-7	-10	24
		-4	22	-24
4	2	-11	12	✓
		8	-12	
$\frac{3}{2}$	2	-3	✓	
		3		
	2	✓		

$x = -2$

$x = 4$

$x = \frac{3}{2}$



b) $f(x) > 0$

$x \in (-2, \frac{3}{2}) \cup (4, \infty)$

c) $f(x) \geq 0$

$x \in [-2, \frac{3}{2}] \cup [4, \infty)$

d) $f(x) < 0$

$x \in (-\infty, -2) \cup (\frac{3}{2}, 4)$

e) $f(x) \leq 0$

$x \in (-\infty, -2] \cup [\frac{3}{2}, 4]$