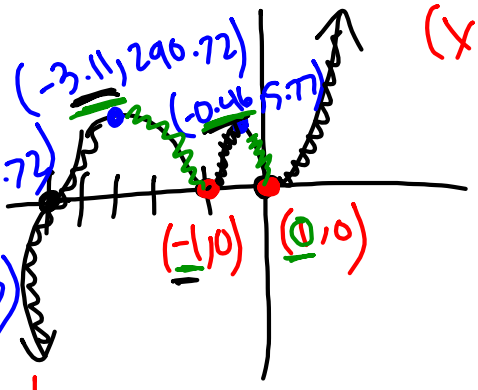
9.



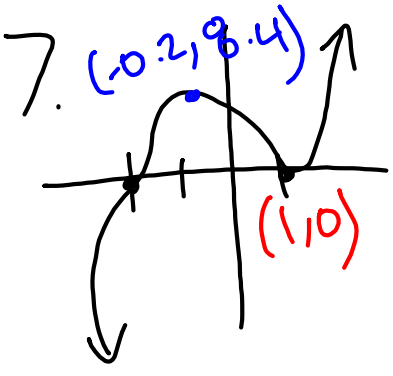
max: local (-3.11, 290.72)
local (-0.46, 5.77)

min: (-1, 0) local
(0, 0) local

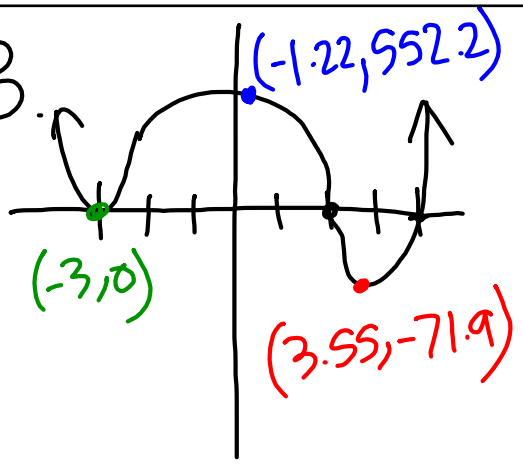
Inc: $(-\infty, -3.11) \cup (-1, -0.46) \cup (0, \infty)$

Dec: $(-3.11, -1) \cup (-0.46, 0)$

7.



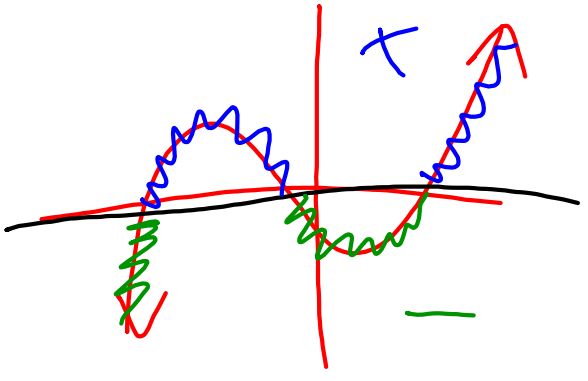
8.



(no book pages)

3-5 Solving Inequalities

Objective: Students can solve polynomial inequalities.

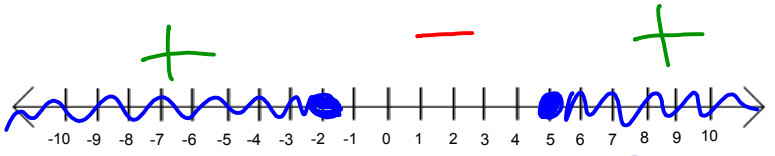


Recall from last year.

Solve the following inequalities. Graph your solution. State your solution in set and interval notation.

$$(x-5)(x+2)\geq 0$$

greater than 0



$(-\infty, -2] \cup [5, \infty)$

Solving Inequalities for Polynomials

1. Find Boundary Points

Zero's

2. Find Solution Intervals

sketch the graph

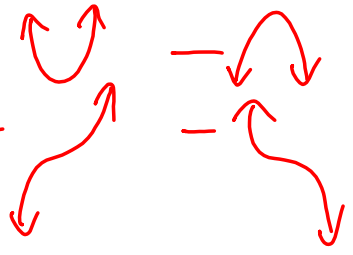
Make a sign chart to be more efficient and use multiplicity rules and end behavior models.

Key concepts

End behavior

Even: + −

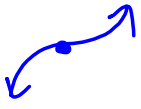
Odd: + −



Multiplicity

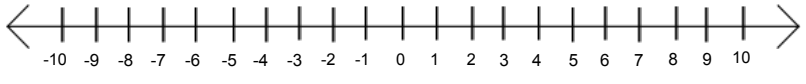
Even : 1 : straight bounce

Odd : inflection



Determine the x-values that cause the polynomial to be a)zero b)positive c)negative

$$f(x) = (x+7)(x+4)(x-6)^2$$



Solve the Polynomial Inequality

① GCF
② Synthetic
③ Quadratic Factor

$$x^3 - 4x^2 - x + 4 \leq 0$$

List all the possible rational zeros (Rational Zeros Theorem)

$\pm \frac{1, 2, 4}{1}$

Check using synthetic division

$$\begin{array}{r|rrrr} 4 & 1 & -4 & -1 & 4 \\ & & 4 & 0 & -4 \\ \hline & 1 & 0 & -1 & \boxed{0} \end{array}$$

Write in factored form

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

$(x-4)(x+1)(x-1)$

-1

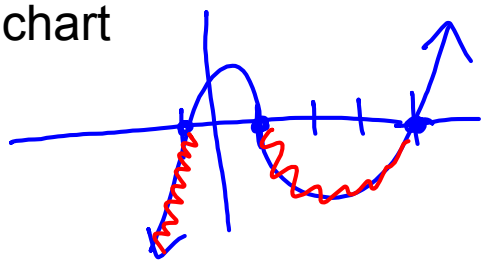
$+1 \quad -1$

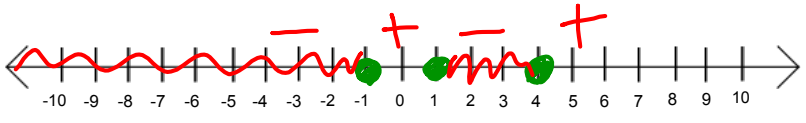
continued

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

↓ closed neg

Sign chart

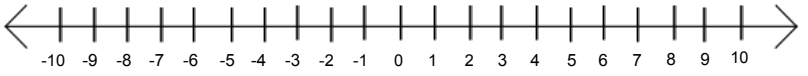




$(-\infty, -1] \cup [1, 4]$

Solve the Polynomial Inequality

$$x^3 + 2x^2 - 19x - 20 > 0$$



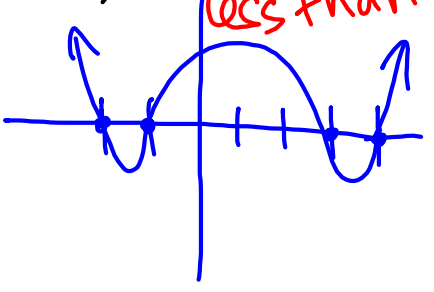
Solve the Polynomial Inequality

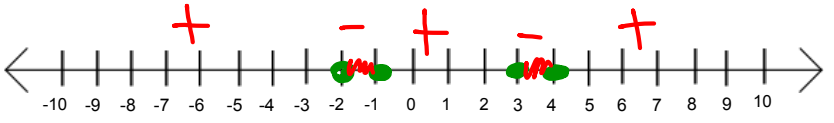
$$(x+1)(x-4)(x-3)(x+2) \leq 0$$

closed

neg

less than





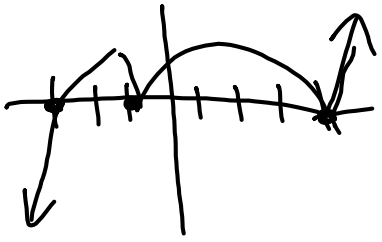
$$[-2,-1] \cup [3,4]$$

Check for understanding:

zeros 0

1. Find where the polynomial is zero, positive, or negative

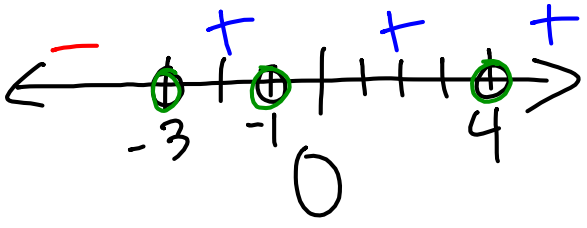
$$f(x) = (x+3)(x+1)^2(x-4)^2$$



zero: $x = -3, -1, 4$

pos: $(-3,-1) \cup (-1,4) \cup (4,\infty)$

neg: $(-\infty,-3)$



0

HW

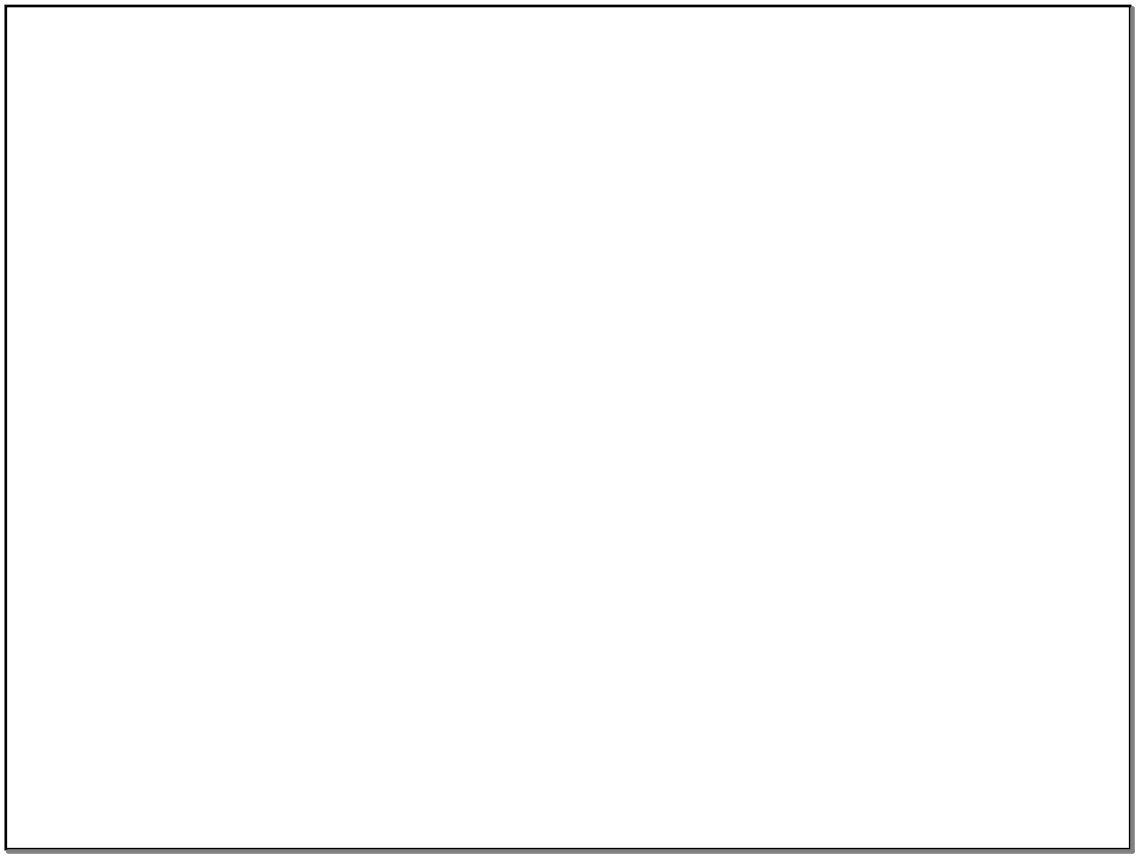
11. GCF

12. GCF

13. 1

14. 21

15 & 16

17. EC

calculator