

Questions from Homework?

2b

7c

9b

12

15

19c

2b) $2(x+3) < -(x-4)$

$2x+6 < -x+4$

$2x+x < 4-6$

$3x < -2$

$x < -\frac{2}{3}$

$\{x \in \mathbb{R} \mid x < -\frac{2}{3}\}$

$(-\infty, -\frac{2}{3})$

7c) $59 < 7x+10 < 73$

$49 < 7x < 63$

$7 < x < 9$

$\{x \in \mathbb{R} \mid 7 < x < 9\}$

$(7, 9)$

9b) $[-6, 4]$

$-6 \leq x \leq 4$

$-12 \leq 2x \leq 8 \quad -2 \leq 2x+10 \leq 18$

Lots of answers!

$3 \geq \frac{-x}{2} \geq -2$

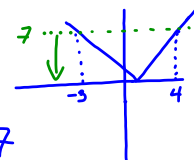
12) a) $18 \leq \frac{5}{9}(F-32) \leq 22$

b) $18(\frac{9}{5}) \leq F-32 \leq 22(\frac{9}{5})$

$18(\frac{9}{5})+32 \leq F \leq 22(\frac{9}{5})+32$

15) a) $|2x-1| < 7$

$-7 < 2x-1 < 7$



$|2x-1| < 7$

$2x-1 < 7$

$-(2x-1) < 7 \Rightarrow 2x-1 > -7$

19c) $|2x+2| < 8$

$\Rightarrow -8 < 2x+2 < 8$

$-10 < 2x < 6$

$-5 < x < 3$

$\{x \in \mathbb{R} \mid -5 < x < 3\}$

$(-5, 3)$

Lesson 4.03 - Solving Polynomial Inequalities Part 1



Learning Goals:

- I can solve any polynomial inequality

$$x^4 + 4x^3 - 12x^2 \leq 0$$

$$x^2(x^2 + 4x - 12) \leq 0$$

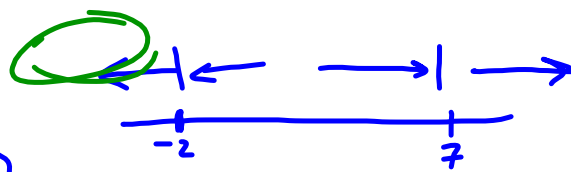
$$x^2(x + 6)(x - 2) \leq 0$$

A polynomial inequality is any inequality that contains polynomial expressions.

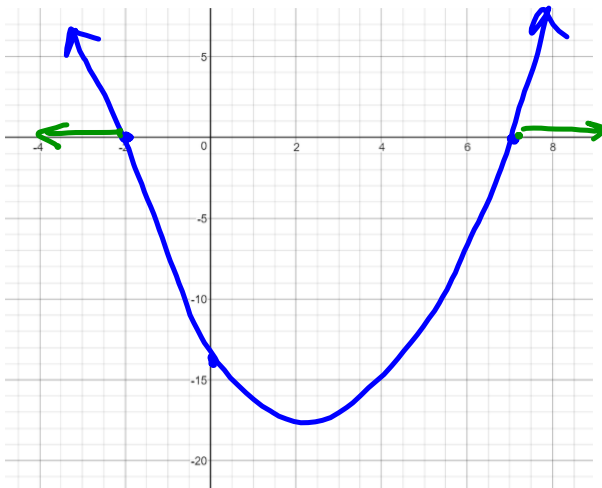
Example

Solve $x^2 - 5x - 14 \geq 0$

$(x-7)(x+2) \geq 0$



Interval	$x < -2$	$-2 < x < 7$	$x > 7$
Sign of $f(x)$	$(-)(-) = +$ $f(x) > 0$	$(-)(+) = (-)$ $f(x) < 0$	$(+)(+) = (+)$ $f(x) > 0$



$\{x \in \mathbb{R} \mid x \leq -2 \text{ or } x \geq 7\}$

Example

Solve $x^4 + 3x^3 - 3x^2 - 11x < 6$

$$x^4 + 3x^3 - 3x^2 - 11x - 6 < 0$$

Possible values

$$\pm (1, 2, 3, 6)$$

$x+1$ is a factor

$$-1 \begin{array}{r|rrrrr} 1 & 3 & -3 & -11 & -6 \\ & -1 & -2 & 5 & 6 \\ \hline & 1 & 2 & -5 & -6 & 0 \end{array}$$

$$(x+1)(x^3 + 2x^2 - 5x - 6) < 0$$

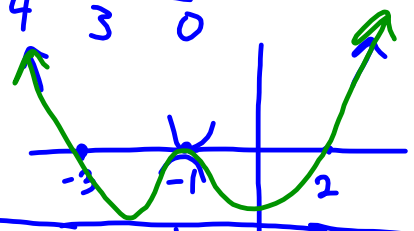
$$(x+1)(x-2)(x^2 + 4x + 3) < 0$$

$x-2$ is a factor

$$2 \begin{array}{r|rrrr} 1 & 2 & -5 & -6 \\ & 2 & 8 & 6 \\ \hline & 1 & 4 & 3 & 0 \end{array}$$

$$(x+1)^2(x-2)(x+3) < 0$$

Zeros ~~1, 2, 3~~
-3, -1, 2



Interval	$x < -3$	$-3 < x < -1$	$-1 < x < 2$	$x > 2$
$f(x) = ?$	$(+)(-)(-)$ $f(x) > 0$	$(+)(-)(+)$ $f(x) < 0$	$(+)(-)(+)$ $f(x) < 0$	$(+)(+)(+)$ $f(x) > 0$

$$\{x \in \mathbb{R} \mid -3 < x < -1 \text{ or } -1 < x < 2\}$$

$$(-3, -1) \cup (-1, 2)$$

$$\{x \in \mathbb{R} \mid -3 < x < 2, x \neq -1\}$$

Homework:

Use a chart to organize your solution instead of a "number line strategy".

pg. 225-228 #1ab, 2, 5, 6*, 7abc, Challenge #17

Error in answer for 6e. The answer should be: $x \leq -\frac{3}{2}$ or $x \geq 3$

