

Semi-Review

- Ch 1 Algebra (Equations and Inequalities) Week 1
- Ch 2 Geometry (Lines, Circles, Ellipses) Week 2

Precalculus

- Ch 3 Functions
- ⋮

1.4 Radical Equations Cont'd

Ex: Solve $x + 2\sqrt{x} - 35 = 0$

$\sqrt{x}^2 + 2\sqrt{x} - 35 = 0$

Let $y = \sqrt{x}$: $y^2 + 2y - 35 = 0$

$(y + 7)(y - 5) = 0$

$(\sqrt{x} + 7)(\sqrt{x} - 5) = 0$

$\sqrt{x} + 7 = 0$

$\sqrt{x} - 5 = 0$

$\sqrt{x} = -7$

$\sqrt{x} = 5$

no solution

$x = 25$

SBS
 $x = 49$
 Check x

Answer = {25}

Ex: Solve by grouping

$$2x^3 - x^2 - 32x + 16 = 0$$

$$x^2(2x-1) - 16(2x-1) = 0$$

$$(x^2-16)(2x-1) = 0$$

$$\begin{array}{cc} \swarrow & \downarrow \\ x^2-16=0 & 2x-1=0 \end{array}$$

$$\begin{array}{cc} x^2=16 & 2x=1 \\ x=\pm 4 & x=\frac{1}{2} \end{array}$$

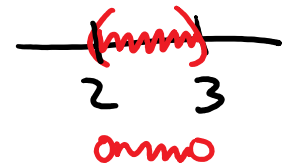
Square Root Method

$$\text{Answer} = \left\{ \pm 4, \frac{1}{2} \right\}$$

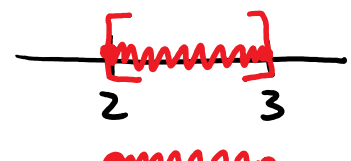
1.5 Solving Inequalities

Warmup	$1 < 2$	$2 > 1$
	$1 \leq 2$	$2 \geq 1$
	$3 \leq 3$	$3 \geq 3$

The open interval $(2, 3)$ is the set of x -values $2 < x < 3$



The closed interval $[2, 3]$: set of x -values $2 \leq x \leq 3$





3 Notations :

Interval	$(1, 2)$
Inequality	$1 < x < 2$
Set	$\{x \mid 1 < x < 2\}$

Use open brackets for $\pm \infty$

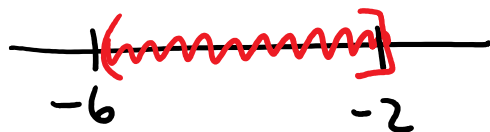
e.g. $x \geq 3$ is written $[3, \infty)$



Ex: Write as an inequality and graph

a) $(-6, -2]$

$$-6 < x \leq -2$$



b) $(-\infty, -4)$

$$x < -4$$



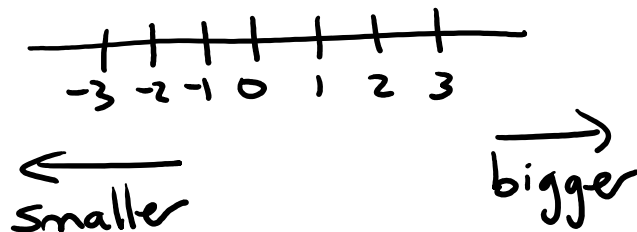
Operations on Inequalities

- Can add to/subtract from both sides
- Can multiply/divide both sides
- Multiplying/dividing by a negative #
reverses the inequality

Why?

$$2 < 3$$

$$\times (-1): -2 > -3$$



Ex: Solve

$$a) \quad 5 - 7x \leq 54$$

$$-7x \leq 49$$

$$\div (-7): \quad x \geq -7$$

$$b) \quad 3x + 3 < 19 + x$$

$$2x + 3 < 19$$

$$2x < 16$$

$$\div 2 \quad x < 8$$

$$(-\infty, 8)$$