

Inequality Trail

Solve, compare, and graph each solution.

GRADE 8 • MA.8.AR.2.2

MA.8.AR.2.2 "Solve two-step linear inequalities in one variable and represent solutions algebraically and graphically."

NAME _____

DATE _____

KEEP IT BALANCED

Use inverse operations to get x alone, just as you do with equations. If you multiply or divide both sides by a negative number, reverse the inequality sign. Then use an open dot for $<$ or $>$ and a closed dot for $\leq$ or $\geq$.

WORKED EXAMPLE

Solve and graph: $4x - 9 \leq 19$

1. Add 9 to both sides: $4x \leq 28$
2. Divide both sides by 4: $x \leq 7$
3. Graph: Place a closed dot at 7 and shade left.

Answer: $x \leq 7$; closed dot at 7, shade left.

PRACTICE 6 problems

1 Solve and graph: $3x + 5 > 20$

ANSWER _____

2 Solve and graph: $6x - 8 \leq 22$

ANSWER _____

3 Solve and graph: $-2x + 6 > 16$

ANSWER _____

4 Solve and graph: $5 - 3x \geq -10$

ANSWER _____

5 Solve and graph: $x/3 + 2 < 6$

ANSWER _____

6 Solve and graph: $-x/5 - 1 \leq 2$

ANSWER _____

APPLY IT Show your work

- 1** A gaming site charges a \$3 service fee plus \$5 for each game credit. You can spend no more than \$33. Let x be the number of credits. Write and solve an inequality, then graph the solution.

WORK SPACE

ANSWER _____

- 2** Your video has 12 votes. It earns 6 new votes each day, and you need at least 42 votes to enter a contest. Let x be the number of days. Write and solve an inequality, then graph the solution.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve and graph: $-5(x - 2) < 35$

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve and graph: $3x + 5 > 20$	$x > 5$; open dot at 5, shade right.
2	Solve and graph: $6x - 8 \leq 22$	$x \leq 5$; closed dot at 5, shade left.
3	Solve and graph: $-2x + 6 > 16$	$x < -5$; open dot at -5, shade left.
4	Solve and graph: $5 - 3x \geq -10$	$x \leq 5$; closed dot at 5, shade left.
5	Solve and graph: $x/3 + 2 < 6$	$x < 12$; open dot at 12, shade left.
6	Solve and graph: $-x/5 - 1 \leq 2$	$x \geq -15$; closed dot at -15, shade right.

PART 2 • APPLY IT

- $3 + 5x \leq 33$, so $x \leq 6$. Closed dot at 6, shade left. You can buy at most 6 credits.** Subtract 3 to get $5x \leq 30$. Divide by 5 to get $x \leq 6$.
- $12 + 6x \geq 42$, so $x \geq 5$. Closed dot at 5, shade right. You need at least 5 days.** Subtract 12 to get $6x \geq 30$. Divide by 6 to get $x \geq 5$.

CHALLENGE

$x > -5$; open dot at -5, shade right.

Accept equivalent inequality forms and correctly drawn graphs with arrows. Students must reverse the inequality only when multiplying or dividing by a negative number.