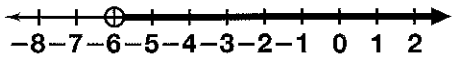
Solving X ÷ Inequalities

Additional Examples — Lesson 3-3

1 EXAMPLE **Solve $\frac{z}{3} > -2$. Graph and check the solutions.**

$3\left(\frac{z}{3}\right) > 3(-2)$ Multiply each side by 3. Do not reverse the inequality symbol.

$z > -6$ Simplify each side.



Check:

$\frac{z}{3} = -2$ Check the computation.

$\frac{-6}{3} = -2$ Substitute -6 for z.

$-2 = -2$ ✔ Simplify.

$\frac{z}{3} > -2$ Check the direction of the inequality.

$\frac{-3}{3} > -2$ Substitute -3 for z.

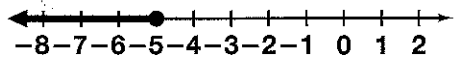
$-1 > -2$ ✔ Simplify.

2 EXAMPLE **Solve $3 \leq -\frac{3}{5}x$. Graph and check the solutions.**

FLIP

$\left(-\frac{5}{3}\right)(3) \geq \left(-\frac{5}{3}\right)\left(-\frac{3}{5}x\right)$ Multiply each side by the reciprocal of $-\frac{3}{5}$, which is $-\frac{5}{3}$, and reverse the inequality symbol.

$-5 \geq x$, or $x \leq -5$ Simplify.



When you × or ÷ by neg # (Both sides)

Check:

$3 = -\frac{3}{5}x$ Check the computation.

$3 = -\frac{3}{5}(-5)$ Substitute -5 for x.

$3 = 3$ ✔

$3 \leq -\frac{3}{5}x$ Check the direction of the inequality.

$3 \leq -\frac{3}{5}(-10)$ Substitute -10 for x.

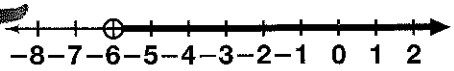
$3 \leq 6$ ✔

FLIP SYMBOL

3 EXAMPLE **Solve $-4c < 24$. Graph the solutions.**

$\frac{-4c}{-4} > \frac{24}{-4}$ Divide each side by -4. Reverse the inequality symbol.

$c > -6$ Simplify.



4 EXAMPLE **Your family budgets $160 to spend on fuel for a trip. How many times can they fill the car's gas tank if it cost $25 each time?**

Relate: cost per tank times number of tanks is at most ≤ total fuel budget

Define: Let t = the number of tanks of gas.

Write: $25 \cdot t \leq 160$

$25t \leq 160$

$\frac{25t}{25} \leq \frac{160}{25}$ Divide each side by 25.

$t \leq 6.4$ Simplify.

Your family can fill the car's tank at most 6 times.