What you will learn about:
Solving Inequalities

$X = 10$

$X + 5 = 15$

$X + 5 > 15$

Interval Notation

$\leq, \geq$ [ ]

$<, >$ ( )

Smaller #, Larger #

$\begin{array}{r} 42 \\ -23 \\ \hline 19 \end{array}$

$18 \geq 42 - 23$

$18 \geq 19$

$\leq, \geq$ solid Dot

$<, >$ open dot

Graph on a number line

$x \leq 1$ $\qquad$ $x < 5$ $\qquad$ $x > 1$

0 1 2 3 $\qquad$ 0 1 2 3 4 5 $\qquad$ 0 1 2

Graph on the number line and write in interval notation

$x \geq -3$ $\qquad$ $x < 2.5$ $\qquad$ $x \leq -\frac{3}{5}$

-3 -2 -1 0 $\qquad$ 0 2 $\qquad$ -1 0

$[-3, \infty)$ $\qquad$ $(-\infty, 2.5)$ $\qquad$ $(-\infty, -\frac{3}{5}]$

Solve each inequality, graph the solution on the number line, and write the solution in interval notation.

$3q \geq 7q - 23$

$-7q \quad -7q$

$\frac{-4q}{-4} \geq \frac{-23}{-4}$

$q \leq \frac{23}{4}$

0

$(-\infty, \frac{23}{4}]$

$6x < 10x + 19$

$-10x \quad -10x$

$\frac{-4x}{-4} < \frac{19}{-4}$

$x > -\frac{19}{4}$

-5 0

$(-\frac{19}{4}, \infty)$

$-24 < -40 + 19$

$-24 < -21$

$24 - 27 > 21 - 28$

$-3 > -7$

Solve each inequality, graph the solution on the number line, and write the solution in interval notation.

$8p + 3(p - 12) > 7p - 28$

$8p + 3p - 36 > 7p - 28$

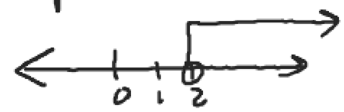
$11p - 36 > 7p - 28$

$-7p \qquad -7p$

$4p - 36 > -28$

$4p > 8$

$p > 2$



$(2, \infty)$

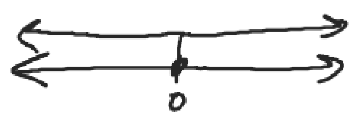
$8x - 2(5 - x) < 4(x + 9) + 6x$

$8x - 10 + 2x < 4x + 36 + 6x$

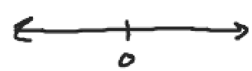
$10x - 10 < 10x + 36$

$-10 < 36$

$(-\infty, \infty)$



$24\left(\frac{1}{3}a\right) - \left(\frac{1}{8}a\right)^{24} > \left(\frac{5}{24}a\right)^{24} + \left(\frac{3}{4}\right)^{24}$



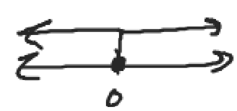
$8a - 3a > 5a + 18$

$5a > 5a + 18$

$0 > 18$

$(\emptyset)$

$24\left(\frac{1}{4}x\right) - \left(\frac{1}{12}x\right)^{24} \le \left(\frac{1}{6}x\right)^{24} + \left(\frac{7}{8}\right)^{24}$



$6x - 2x \le 4x + 21$

$4x \le 4x + 21$

$0 \le 21$

$(-\infty, \infty)$

>	≥	<	≤
is greater than	is greater than or equal to	is less than	is less than or equal to
is more than	is at least	is smaller than	is at most
is larger than	is no less than	has fewer than	is no more than
exceeds	is the minimum	is lower than	is the maximum

Translate and solve. Then write the solution in interval notation and graph on the number line.

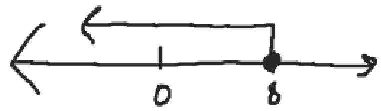
Twleve times a number is no more than 96.

$12x \leq 96$

$\frac{8}{12\overline{)96}}$
$\underline{96}$

$x \leq 8$

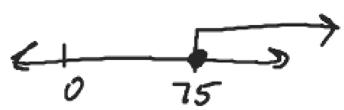
$(-\infty, 8]$



Thirty less than x is at least 45.

$x - 30 \geq 45$

$x \geq 75$



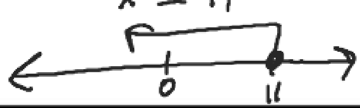
$[75, \infty)$

Four more than a number is at most 15.

$x + 4 \leq 15$

$x \leq 11$

$(-\infty, 11]$



$\frac{1}{6}(1 - 6x) = -\frac{1}{3}\left(6x + \frac{1}{2}\right)$

46. $\frac{1}{2}\left(2t - \frac{3}{4}\right) + \frac{2}{5} = \frac{4}{5}t$

$\frac{3}{8}(m + 8) - \frac{3}{16} = 2\left(m + \frac{3}{4}\right) + \frac{1}{2}$

48. $0.3(x + 5) = 5(0.1 + 0.11x)$

$\frac{8}{3x}\left(\frac{3}{4}\right)$

$3.75 - 2.5(p + 1) = 0.5p + 4.25$

50. $2.3y = 0.15(2y - 3) - 0.6$

24

nk Outside the Box:

e each.

$\frac{2x - 18}{4} = \frac{3x + 1}{2}$

52. $\frac{x + 9}{5} = \frac{x - 7}{10}$

$\frac{x + 3}{8} - \frac{x}{2} = 5$

54. $\frac{x - 5}{6} = \frac{x}{4} - 1$

$$\frac{3}{8}(m+8) - \frac{3}{16} = 2\left(m + \frac{3}{4}\right) + \frac{1}{2}$$

$6(m+8) - 3 = 32(m + \frac{3}{4}) + 8$

$6m + 48 - 3 = 32m + 24 + 8$

$6m + 45 = 32m + 32$

$13 = 26m$

$m = \frac{1}{2}$

$$3.75 - 2.5(p + 1) = 0.5p + 4.25$$

$3.75 - 2.5p - 2.5 = .5p + 4.25$

$1.25 - 2.5p = .5p + 4.25$

$-3p = 3$

$p = -1$

nk Outside the Box:

e each.

$$\frac{2x-18}{4} = \frac{3x+1}{2}$$

$2(2x-18) = 4(3x+1)$

$4x - 36 = 12x + 4$

$-36 = 8x + 4$

$-40 = 8x$

$x = -5$

$${}^{4}\left(\frac{x+3}{8}\right) - \left(\frac{x}{2}\right)^{8} = (5)^{8}$$

$x + 3 - 4x = 40$

$-3x + 3 = 40$

$-3x = 37$

$x = \frac{-37}{3}$