

# Outcome 2 - Solving Linear Inequalities

## Bronze examples...

Examples...

Solve the following inequalities...

$$\begin{array}{rcl} 7x - 2 > 19 & & \text{Add 2!} \\ +2 & +2 & \\ \hline 7x > 21 & & \text{Divide by 7!} \\ +7 & +7 & \\ \hline x > 3 \end{array}$$

$$\begin{array}{rcl} 8p + 5 \leq 5p + 23 & & \text{Get all the p's} \\ -5p & -5p & \text{on one side and} \\ \hline 3p + 5 \leq 23 & & \text{the numbers on} \\ -5 & -5 & \text{the other!} \\ \hline 3p \leq 18 & p \leq 6 & \\ +3 & +3 & \text{Divide by 3!} \end{array}$$

## Silver examples

Examples...

Solve the following inequalities...

$$\begin{array}{rcl} 7 - 2x < 15 & & \text{Take away 7!} \\ -7 & -7 & \\ \hline -2x < 8 & & \text{Divide by -2!} \\ +(-2) & +(-2) & \text{**When dividing by} \\ & & \text{a negative, you must} \\ & & \text{reverse the sign!**} \\ \hline x > -4 \end{array}$$

$$\begin{array}{rcl} 12 - 4x > 8 & & \text{Take away 12!} \\ -12 & -12 & \\ \hline -4x > -4 & & \text{Divide by -4!} \\ +(-4) & +(-4) & \\ \hline x < 1 \end{array}$$

## Gold examples

Examples... \*\*Eliminate fractions!\*\*

Solve the following inequality...

$$\times 4) \frac{x+5}{2} + \frac{x-3}{4} > 2$$

Multiply ALL through by the L.C.M. of the denominators!

$$\frac{4x+20}{2} + \frac{4x-12}{4} > 8$$

Do the division!

$$2x + 10 + x - 3 > 8$$

Then solve as normal!

$$\begin{array}{rcl} 3x + 7 > 8 & & \\ -7 & -7 & \\ \hline 3x > 1 & x > \frac{1}{3} & \\ +3 & +3 & \end{array}$$

## Bronze Questions

Solve the following inequalities...

- 1  $3a + 4 < 19$
- 2  $7c + 5 > 33$
- 3  $8t - 3 \leq 45$
- 4  $4s - 2 < 10$
- 5  $12n - 5 \geq 7$
- 6  $8p + 2 > 5p + 11$
- 7  $8l + 2 \leq l + 23$
- 8  $6k - 5 \geq k - 30$
- 9  $7j - 2 > 3j - 38$
- 10  $8b - 3 < 3b - 38$

## Silver Questions

Solve the following inequalities...

- 1  $9 - 3x < 15$
- 2  $2 - 5a > 17$
- 3  $5 - 3p \geq 20$
- 4  $7 - 4c \leq 31$
- 5  $4 - 3d < 31$
- 6  $8 - 2t \geq 2$
- 7  $9 - 5m > 4$
- 8  $8 - 4s < 0$
- 9  $30 - 7w < -5$
- 10  $7 - 10n \leq -23$

## Gold Questions

Solve the following inequalities...

- 1  $\frac{x}{4} < 3$
- 2  $\frac{x+1}{5} > 2$
- 3  $\frac{3x+1}{8} \geq 2$
- 4  $\frac{4x-3}{10} \leq \frac{4}{5}$
- 5  $\frac{x}{3} + \frac{x}{2} > 4$
- 6  $\frac{x}{9} + \frac{x}{3} \geq 2$
- 7  $2x - 1 < \frac{x+5}{2}$
- 8  $3x - 1 > \frac{4x-13}{3}$
- 9  $\frac{x+3}{8} + \frac{x-1}{4} \geq 5$
- 10  $\frac{2x+1}{2} + \frac{x-5}{3} \leq 1$

## Bronze Answers

1.  $a < 5$

2.  $c > 4$

3.  $t \leq 6$

4.  $s < 3$

5.  $n \geq 1$

6.  $p > 3$

7.  $l \leq 3$

8.  $k \geq -5$

9.  $j > -9$

10.  $b < -7$

## Silver Answers

1.  $x > -2$

2.  $a < -3$

3.  $p \leq -3$

4.  $c \geq -6$

5.  $d > -9$

6.  $t \leq 3$

7.  $m < 1$

8.  $s > 2$

9.  $w > 5$

10.  $n \geq 3$

## Gold Answers

1.  $x < 12$

2.  $x > 9$

3.  $x \geq 5$

4.  $x \leq 11/4$

5.  $x > 24/5$

6.  $x \geq 9/2$

7.  $x < 7/3$

8.  $x > -2$

9.  $x \geq 13$

10.  $x \leq 13/8$