

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...

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

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

Gold example

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. $x \leq 13/8$ |