Linear Inequalities, Compound and Integer Solutions

Core Worksheet

Worked Examples & Guided Practice

I Do (Teacher Model) Solve $5x - 3 \leq 2x + 9$ and write down all the integer solutions for x if $x > 0$.

We Do (Guided Practice) Solve the compound inequality $-5 < 2x + 1 \leq 9$.

You Do (Independent Practice) List all the integer values of n that satisfy $-3 \leq 2n < 8$.

Challenge (Extension) Solve the inequality $\dfrac{3x - 2}{4} > \dfrac{x + 1}{2} + 1$.

Practice Perfect Questions

Q1. Solve $4x + 7 < 27$.

Q2. Solve $3(2x - 1) \geq 15$.

Q3. Solve $-2 \leq x + 3 < 5$.

Q4. Solve $-7 \leq 3x - 1 < 8$ and list all integer solutions for x.

Q5. Write down all integer values of n where $-4 < n \leq 1$.

Q6. Solve $5x - 2 > 7x + 8$.

Answers & Worked Solutions

Model Solutions

- **I Do:** $3x - 3 \leq 9 \implies 3x \leq 12 \implies x \leq 4$. If $x > 0$, integer solutions are $x = 1, 2, 3, 4$.
- **We Do:** Subtract 1: $-6 < 2x \leq 8$. Divide by 2: $-3 < x \leq 4$.
- **You Do:** Divide by 2: $-1.5 \leq n < 4 \implies n = -1, 0, 1, 2, 3$.
- **Challenge:** Multiply by 4: $3x - 2 > 2(x + 1) + 4 \implies 3x - 2 > 2x + 2 + 4 \implies 3x - 2 > 2x + 6 \implies x > 8$

Practice Perfect Questions Solutions

Q1. $4x < 20 \implies x < 5$

Q2. $6x - 3 \geq 15 \implies 6x \geq 18 \implies x \geq 3$

Q3. Subtract 3: $-5 \leq x < 2$

Q4. Add 1: $-6 \leq 3x < 9 \implies -2 \leq x < 3$. Integer solutions: $x = -2, -1, 0, 1, 2$

Q5. $n = -3, -2, -1, 0, 1$

Q6. $-2x - 2 > 8 \implies -2x > 10 \implies x < -5$