ALGEBRA: Inequalities 1

In all questions, change the subject of the inequality to x

Symbols

x is equal to 7:	$x = 7$
1 is less than 5:	$1 < 5$
x is less than or equal to 10:	$x \leq 10$
x is greater than 2:	$x > 2$
x is greater than or equal to 3:	$x \geq 3$

Examples:

(1) $3x + 2 < x - 3$

Subtract x from both sides:	$2x + 2 < -3$	
Subtract 2 from both sides:	$2x < -5$	
Divide both sides by 2:	$x < -\frac{5}{2}$	"x is less than minus five over two"

(2) $4x + 1 > \frac{5x-3}{2}$

Multiply both sides by 2:	$2(x + 2) > 5x - 3$	
Expand:	$2x + 4 > 5x - 3$	
Subtract $2x$ from both sides:	$4 > 3x - 3$	
Add 3 to both sides:	$7 > 3x$	
Divide both sides by 3:	$\frac{7}{3} > x$	"seven thirds is more than x"
Flip round:	$x < \frac{7}{3}$	"x is less than seven thirds"

(3) $-x \geq 8$

Approach 1

Times by -1. Flip the signs and flip the symbol:	$+x \leq -8$
	$x \leq -8$

Approach 2

Add x to both sides:	$0 \geq 8 + x$
Subtract 8 from both sides:	$-8 \geq x$
Flip round:	$x \leq -8$

Exercises:

(4) $7p + 3 < 3p + 10$

(5) $9w - 100 \geq 99w + 80$

(6) $\frac{6-d}{2} < 9 - d$

(7) $\frac{t-10}{3} > \frac{2t+3}{5}$

(8) $-6r \leq 15$

(9) $3 - 5k > 11 + k$

(10) $\frac{7-2m}{6} > \frac{6m+1}{4}$