

## INEQUALITIES

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# Inequalities

$<$  less than

$\leq$  less than or equal to

$>$  more than

$\geq$  more than or equal to

Put the correct inequality in between the numbers. Either  $>$  or  $<$ .

1) 3      8

2) 0.563      0.48

3) 0.862      0.9

4) -3      -7

5) -3      6

6)  $\frac{1}{4}$        $\frac{1}{3}$

7)  $\frac{2}{3}$        $\frac{1}{2}$

8)  $\frac{3}{5}$        $\frac{2}{3}$

9)  $\frac{4}{5}$       0.75

10) 0.35       $\frac{3}{8}$

n could ONLY be -5 , -2, 0 , 3, 4 or 7.

Write down the possible value of n for each of these inequalities.

e.g. if  $n > 3$  then n could be 4 or 7.

1)  $n \geq 3$

2)  $n < 4$

3)  $2n > 6$

4)  $n < 0$

5)  $10 - n > 6$

6)  $n^2 > 10$

7)  $n \div 2 \leq 2$

8)  $2n + 1 < 7$

9)  $n^2 + n < 20$

10)  $10 \div n < 2$

n can be any whole number. Positive, negative or zero. Write all the possible values of n.

e.g.  $2 < n < 8$ , means 2 is less than n and n is less than 8. n could be 3, 4, 5, 6 or 7.

1)  $4 < n < 7$

2)  $3 \leq n \leq 6$

3)  $-2 \leq n < 2$

4)  $-3 < n \leq 3$

5)  $-8 < n \leq -4$

6)  $-1 \leq n \leq 2$

7)  $n > 2$  and  $n < 5$

8)  $n \geq -2$  and  $n < 1$

9)  $n \geq 0$  and  $n < 1$









10)  $n^2 \leq 9$

Inequalities

X is an integer. Shade in the possible values of x

1	$4 < x < 7$	-3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
2	$4 \leq x < 7$	-3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
3	$4 < x \leq 7$	-3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
4	$4 \leq x \leq 7$	-3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
5	$-2 < x \leq 5$	-3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
6	$0 \leq x < 3$	-3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
7	$-1 < x < 1$	-3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
8	$-1 \leq x \leq 4$	-3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

Fill in either the inequalities or the numbers corresponding to the shading.

9	$\square \leq x \square 8$	-3  8 9 10
10	$\square \leq x \leq \square$	-3 -2 -1  6 7 8 9 10
11	$3 \square x \square 8$	-3 -2 -1 0 1 2 3  8 9 10
12	$-2 \square x \square 3$	-3  4 5 6 7 8 9 10
13	$\square < x < \square$	-3 -2 -1 0 1 2 3 4 5 6  10
14	$\square < x \square 7$	-3 -2 -1 0 1  8 9 10
15	$3 \square x \leq \square$	-3 -2 -1 0 1 2  5 6 7 8 9 10
16	$\square \leq x < \square$	-3 -2  9 10

1 Write down all the whole numbers (n) that fit into this inequality  $-1 < n \leq 3$

2 Write down all the whole numbers (n) that fit into this inequality  $-3 \leq n \leq 1$

3 Write down all the whole numbers (n) that fit into this inequality  $6 \leq n < 10$

4 Write down all the whole numbers (n) that fit into this inequality  $2 < n < 9$

5 Write down the FOUR smallest whole numbers (n) that fit into this inequality  $n > 1$

6 Write down the FOUR largest whole numbers (n) that fit into this inequality  $n \leq 8$

Using Number lines to represent inequalities

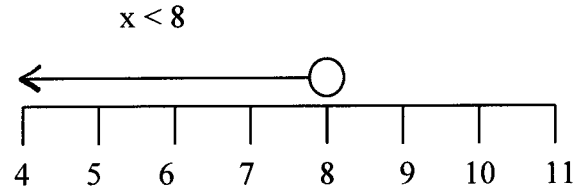
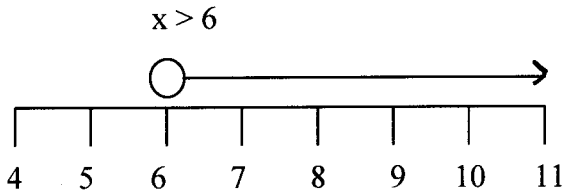
> greater than

≥ greater than or equal to

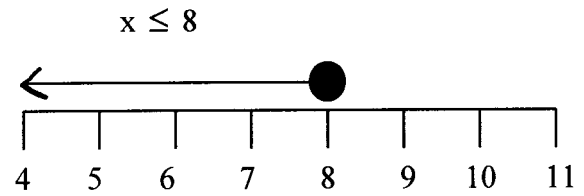
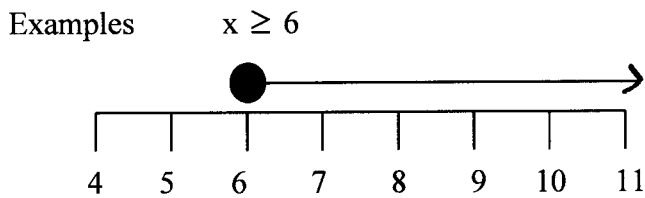
< less than

≤ less than or equal to

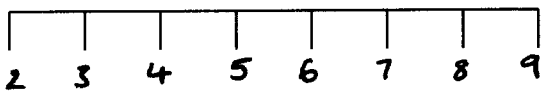
An **unshaded** circle for < and >



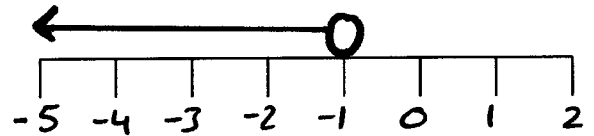
A **shaded** circle for ≥ and ≤



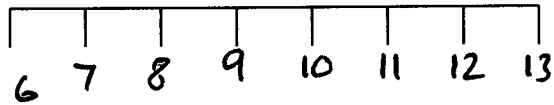
①  $x < 5$



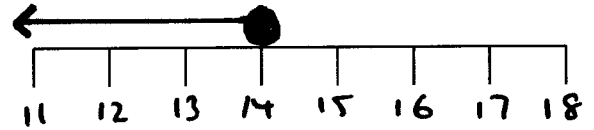
⑥ \_\_\_\_\_



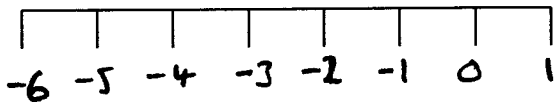
②  $x > 9$



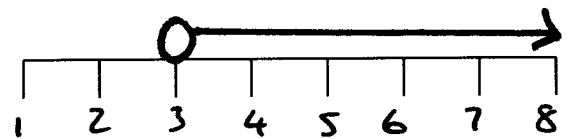
⑦ \_\_\_\_\_



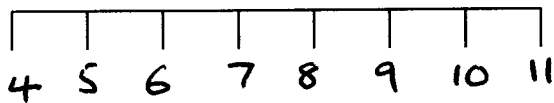
③  $x ≥ -3$



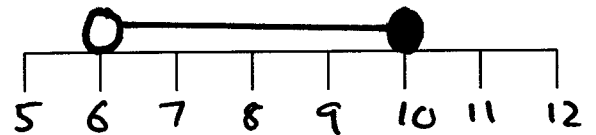
⑧ \_\_\_\_\_



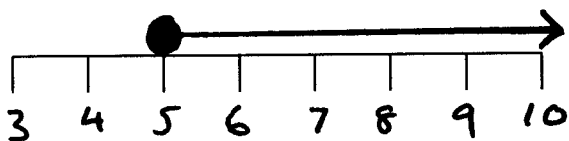
④  $x ≤ 7$



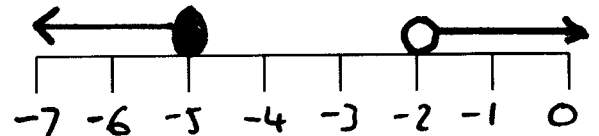
⑨ \_\_\_\_\_



⑤ \_\_\_\_\_



⑩ \_\_\_\_\_



Questions 1 to 4 Draw the inequality on the number line

5 → 10 Write the inequality ④ from the number line.

④

## Equations (one answer)

Solve these equations

1)  $x - 3 = 13$

2)  $x + 4 = 11$

3)  $2x + 1 = 21$

4)  $3x - 3 = 9$

5)  $4x - 3 = 21$

6)  $\frac{x}{2} - 3 = 5$

7)  $14 = x + 2$

8)  $7 = 10 - x$

## Inequalities (a range of answers)

Complete the number scale, put the solution on the number line

1)  $x - 3 > 13$



2)  $x + 4 < 11$



3)  $2x + 1 \geq 21$



4)  $3x - 3 \leq 9$



5)  $4x - 3 \leq 21$



6)  $\frac{x}{2} - 3 < 5$



7)  $14 \geq x + 2$



8)  $7 > 10 - x$



Solve these Equations and Inequalities

1) Equation  $x + 3 = 7$   $x = 4$

Inequalities  $x + 3 > 7$   $x$

$x + 3 < 7$   $x$

$x + 3 \leq 7$   $x$

$x + 3 \geq 7$   $x$

5) Equation  $4x + 2 = 30$   $x =$

Inequalities  $4x + 2 > 30$   $x$

$4x + 2 < 30$   $x$

$4x + 2 \leq 30$   $x$

$4x + 2 \geq 30$   $x$

2) Equation  $2x + 1 = 11$   $x =$

Inequalities  $2x + 1 > 11$   $x$

$2x + 1 < 11$   $x$

$2x + 1 \leq 11$   $x$

$2x + 1 \geq 11$   $x$

6) Equation  $14 = 6x + 2$   $x =$

Inequalities  $14 > 6x + 2$   $x$

$14 < 6x + 2$   $x$

$14 \leq 6x + 2$   $x$

$14 \geq 6x + 2$   $x$

3) Equation  $12 - x = 6$   $x =$

Inequalities  $12 - x > 6$   $x$

$12 - x < 6$   $x$

$12 - x \leq 6$   $x$

$12 - x \geq 6$   $x$

7) Equation  $8x - 2 = 5x + 7$   $x =$

Inequalities  $8x - 2 > 5x + 7$   $x$

$8x - 2 < 5x + 7$   $x$

$8x - 2 \leq 5x + 7$   $x$

$8x - 2 \geq 5x + 7$   $x$

4) Equation  $3x - 1 = 8$   $x =$

Inequalities  $3x - 1 > 8$   $x$

$3x - 1 < 8$   $x$

$3x - 1 \leq 8$   $x$

$3x - 1 \geq 8$   $x$

8) Equation  $4x - 2 = 6x + 8$   $x =$

Inequalities  $4x - 2 > 6x + 8$   $x$

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

$4x - 2 \leq 6x + 8$   $x$

$4x - 2 \geq 6x + 8$   $x$

Solve these inequalities

9)  $4x + 1 > 2x + 9$

10)  $3x + 8 < 7x - 4$

# Inequalities and Regions

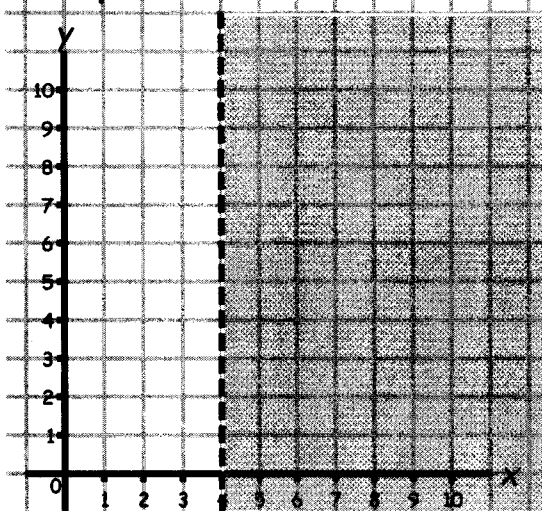
————— Solid line  $\leq$  or  $\geq$

----- Broken line  $<$  or  $>$

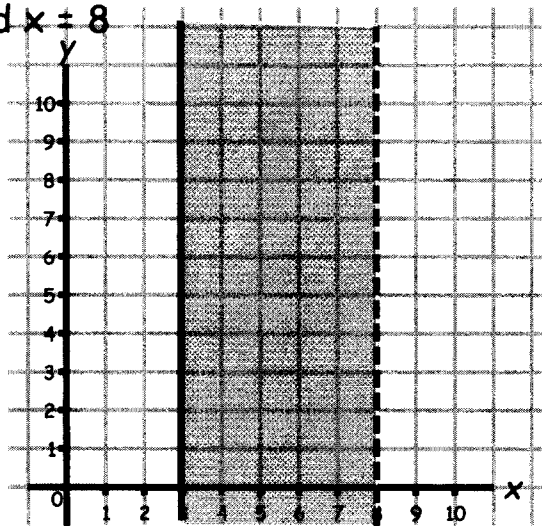
Nearly always describe the shaded region, but read the question carefully to check.

Test with a point to make sure.

the equation of the line is  $x = 4$



the equations of the lines are  $x = 3$  and  $x = 8$



the equation of the line is  $y = 2x + 2$

