There are many INEQUALITIES in life....

When things are not equal there are inequalities.

The 4 signs we use in maths are:

$a < b$ a is less than b

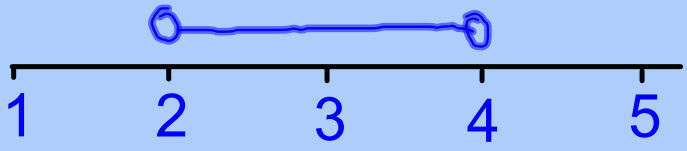
$a \leqslant b$ a is less than or equal to b

$c > d$ c is greater than d

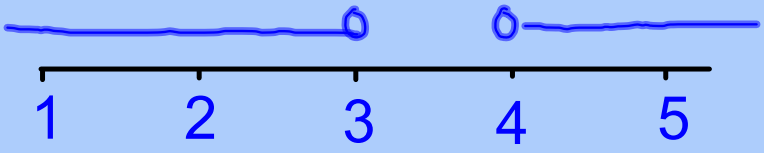
$c \geqslant d$ c is greater than or equal to d

game

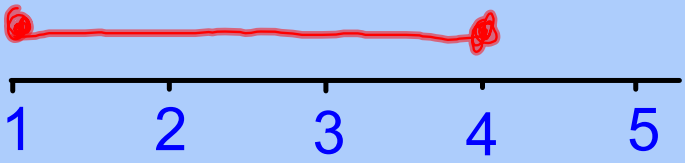
Inequalities on a number line



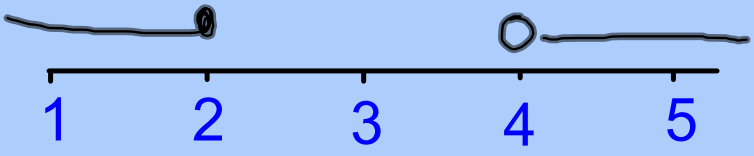
$2<x<4$



$x<3,\ x>4$



$1 \leqslant x \leqslant 4$



$x \leqslant 2,\ x>4$

You may have to write down all the integers (whole numbers) that satisfy an inequality:

4< x <9 $x = 5, 6, 7, 8$

$6 \leq x < 10$ $x = 6, 7, 8, 9$

$(-6)^2 = 36$

$x^2 > 25$

$x = -6, 6, 7, 8 \ldots 6$

$x = -6, -7, -8, -9, -$

2. Represent the following inequalities on a number line:

1) 4< x < 7

2) -3< x < 5

3) 7<x, x< 5

4) x< -2 , x≥ 3

5) $x^2 \leq 49$

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Solving equations revision

2x+5 = 20

$2x = 20 - 5$

$2x = 15$ $\quad x = 7\frac{1}{2}$

3x - 2 = 19

$3x = 21$

$x = 7$

23 - 2x = 11

$23 = 11 + 2x$ $\quad 2x = 12$

$23 - 11 = 2x$ $\quad x = 6$

17 - 3x = -1

$17 = -1 + 3x$

$18 = 3x$ $\quad x = 6$

$\frac{4x + 2}{3} = 5$

$4x + 2 = 15$ $\quad x = \frac{13}{4} = 3\frac{1}{4}$

$4x = 13$

7x + 3 = 15 - 5x

$7x + 5x + 3 = 15$

$12x = 12$ $\quad x = 1$

Ext: $\frac{5x + 15}{2} = \frac{3x + 16}{4}$

$2\cancel{4} \times \frac{(5x + 15)}{\cancel{2}} = \frac{(3x + 16) \times \cancel{4}}{\cancel{4}}$

$10x + 30 = 3x + 16$

$10x - 3x = 16 - 30$

$7x = -14$ $\quad x = -2$

Solving Inequalities

You may have to solve an inequality: (treat it like an equation, but beware of negatives)

$2x > 6$

$x > 3$

$2x = 6$

$x = 3$

$3x - 2 < 7$

$3x < 9$

$x < 3$

$3x - 2 = 7$

$3x = 9$

$x = 3$

$\frac{3x+4}{5} > 5$

$x > 7$

$3x + 4 = 25$

$3x = 21$

$x = 7$

$-2 < 3x + 1 \leq 4$

$-1 < x \leqslant 1$

$-2 = 3x + 1$

$-1 - 2 = 3x$

$-3 = 3x$ $x = -1$

$3x + 1 = 4$

$x = 1$

$\frac{x}{2} + 3 < 5$

$x < 4$

method 1

$\frac{x}{2} + 3 = 5$

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

$\frac{x}{2} = 2$

$x = 4$

method 2

$\frac{x}{2} + 3 = 5$

$x + 6 = 10$

$x = 4$

Odds only

Remember to check your answers

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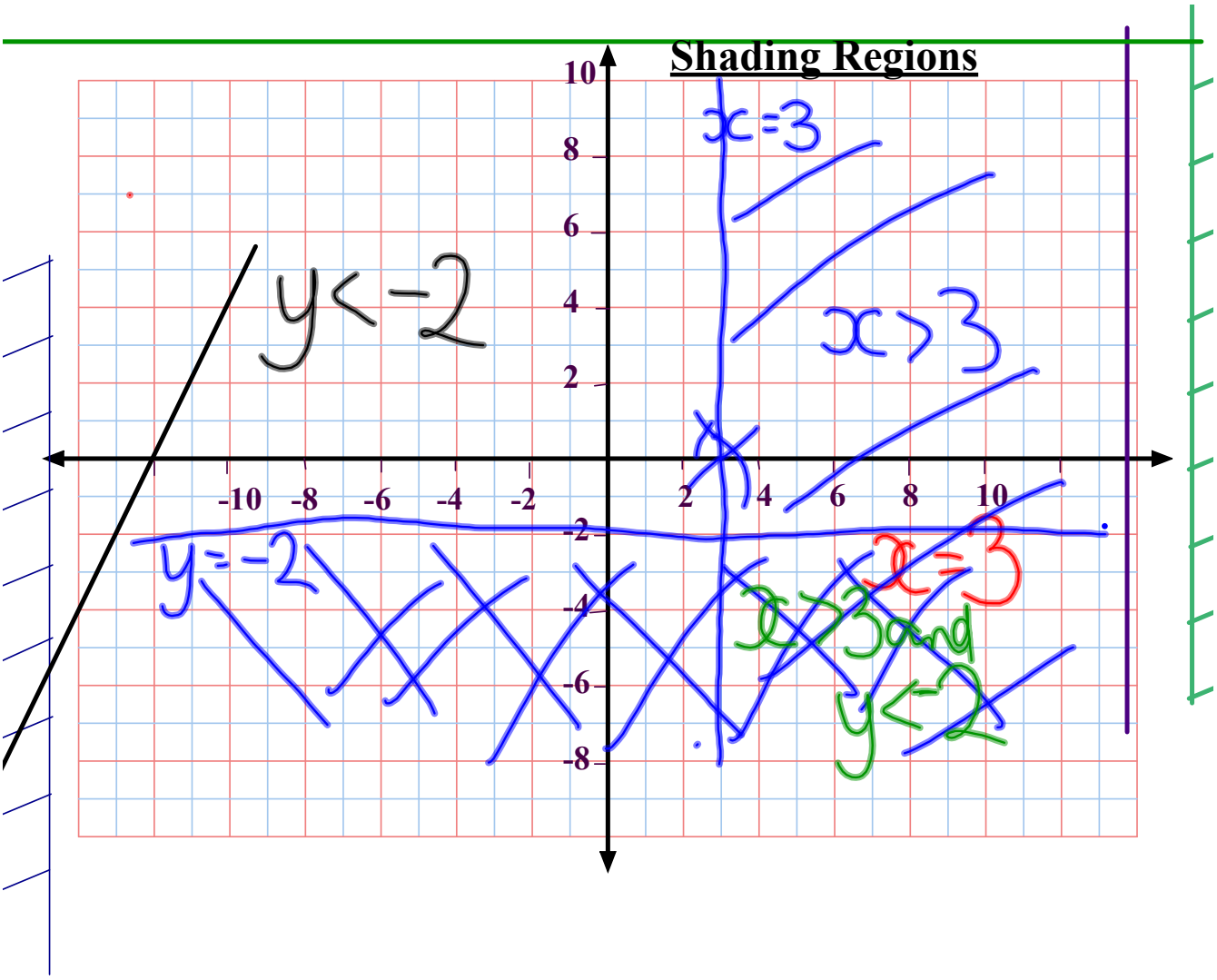
$-x < 5$

$-5 < x$

$-x = 5$

$x = -5$

Shading Regions



1. x > 3

2. y< 2

3.x> 4 and y< -1

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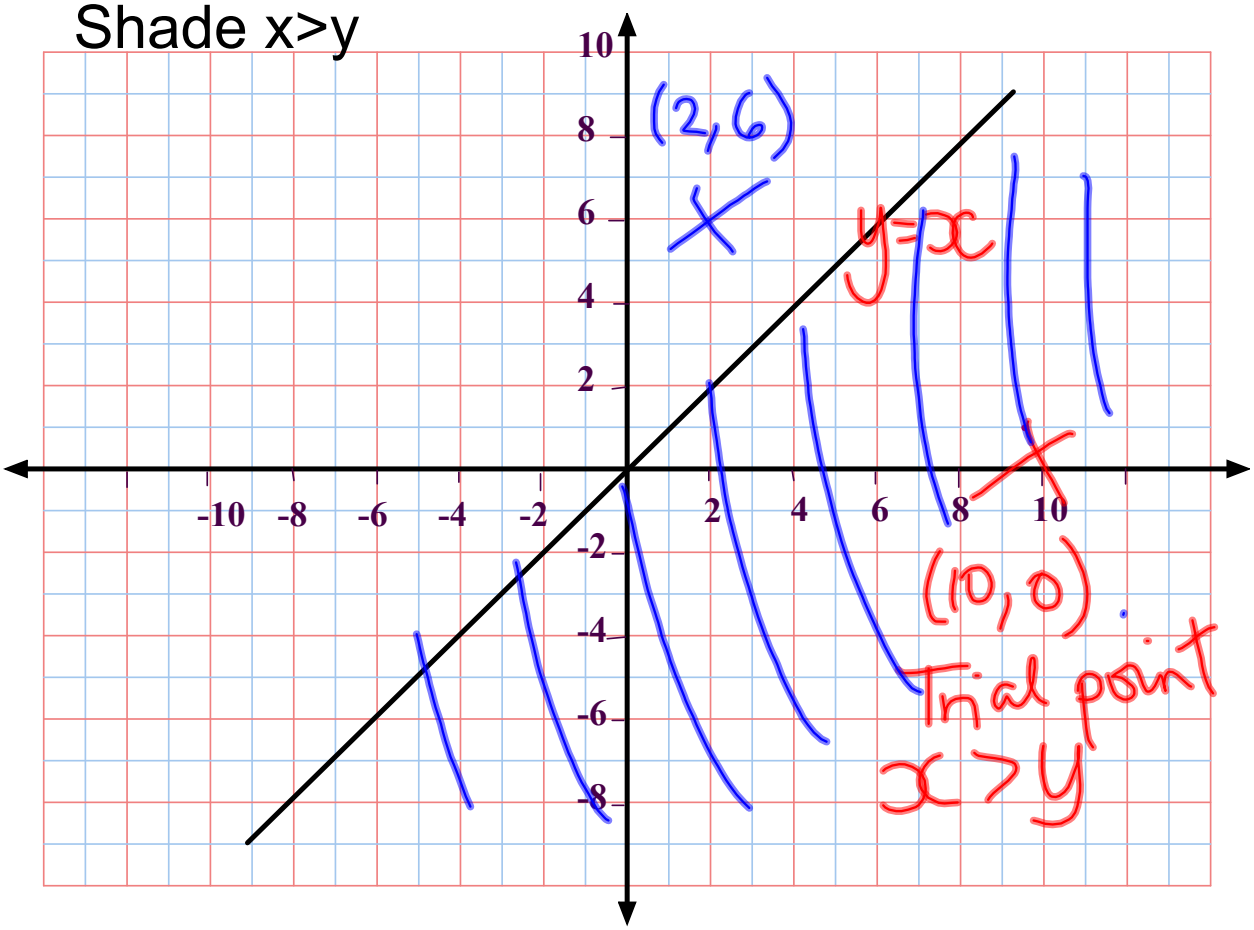
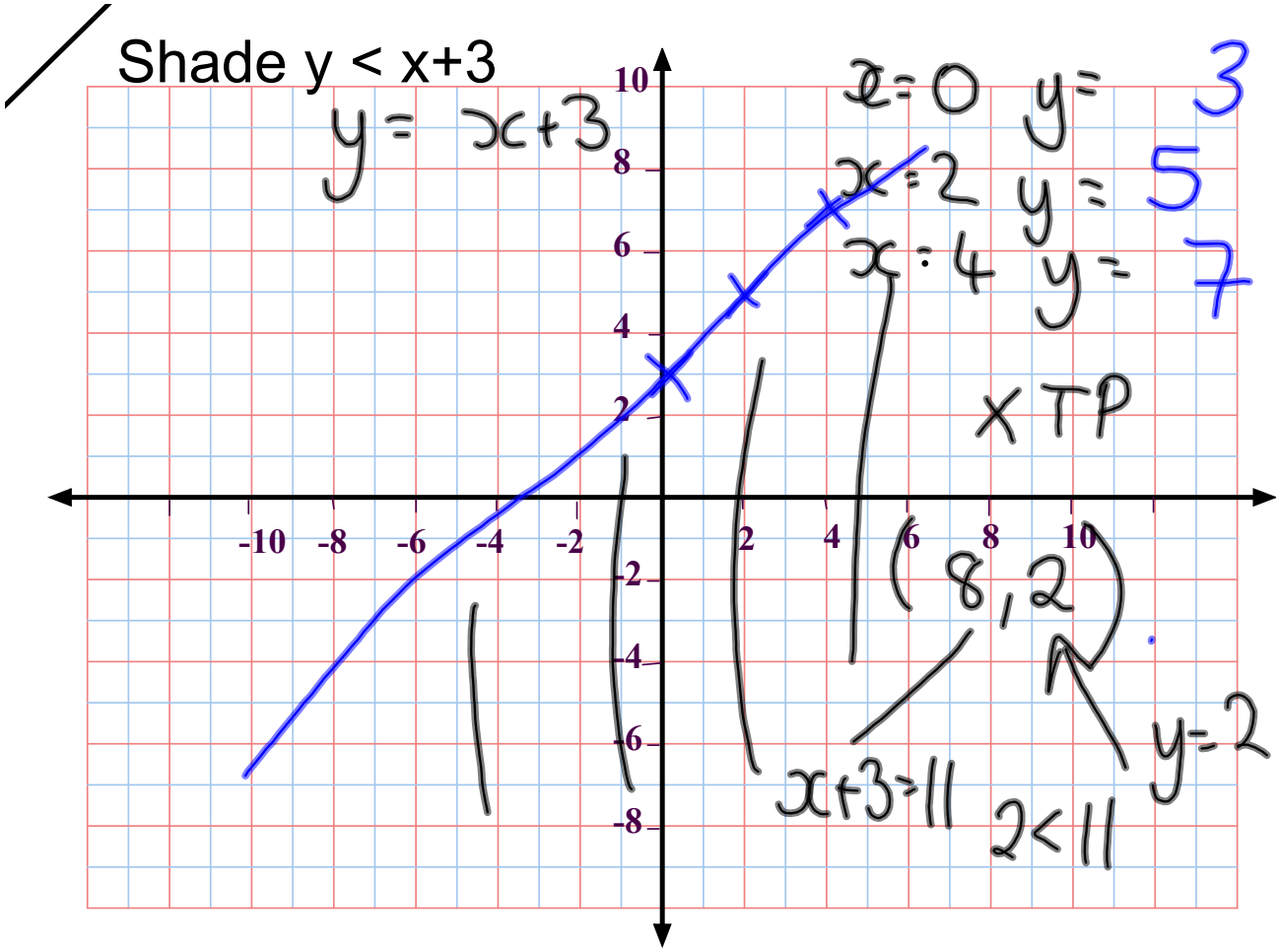
Shade x>y



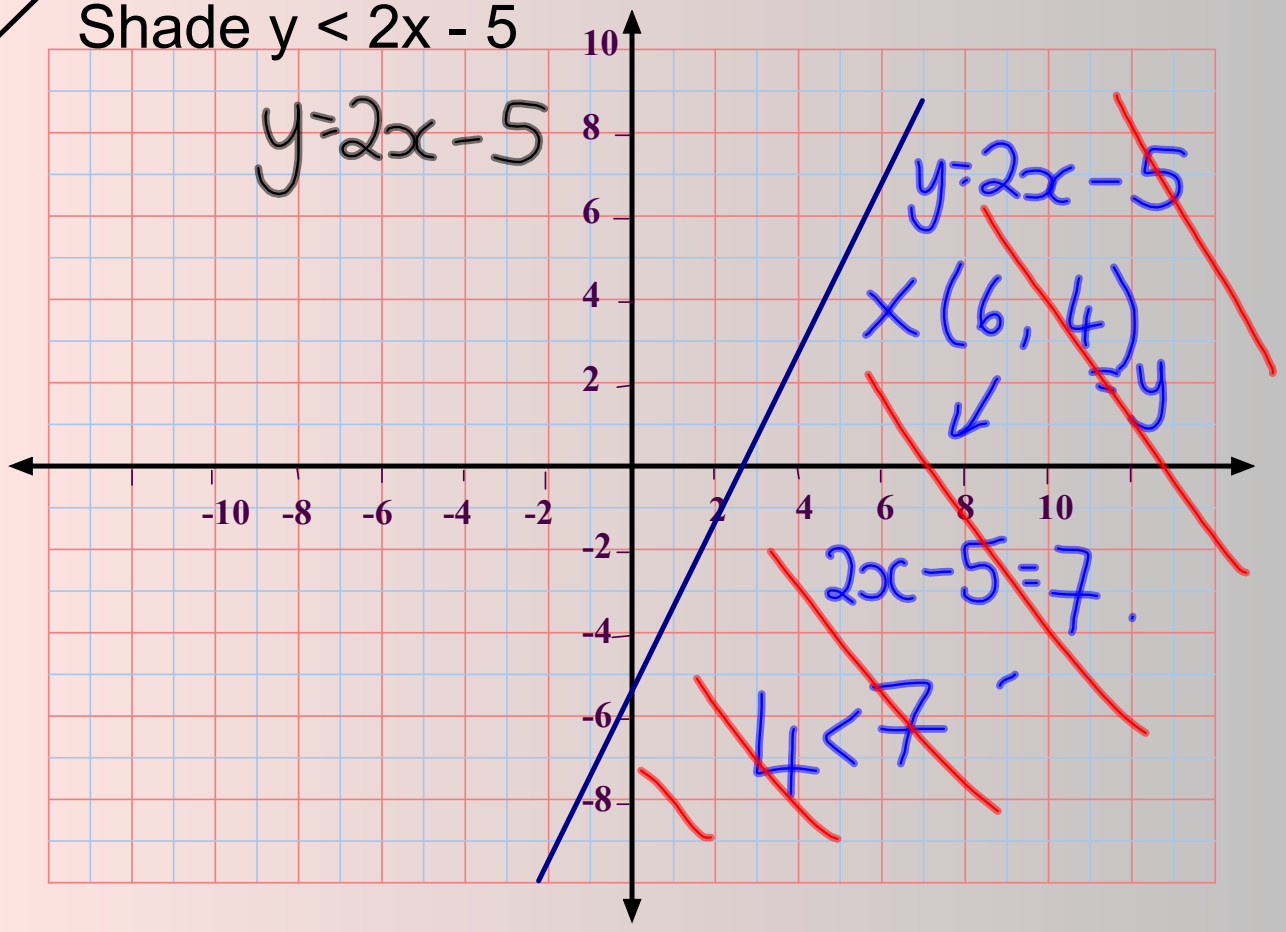
Shade the region for which

$y > 6$

and $y \leq x$


Shade y < x+3
y = x+3
x = 0 y = 3
x = 2 y = 5
x = 4 y = 7
x TP
(8,2)
y = 2
x+3 > 11
2 < 11

Shade $y < 2x - 5$



x	
y=2x-5	

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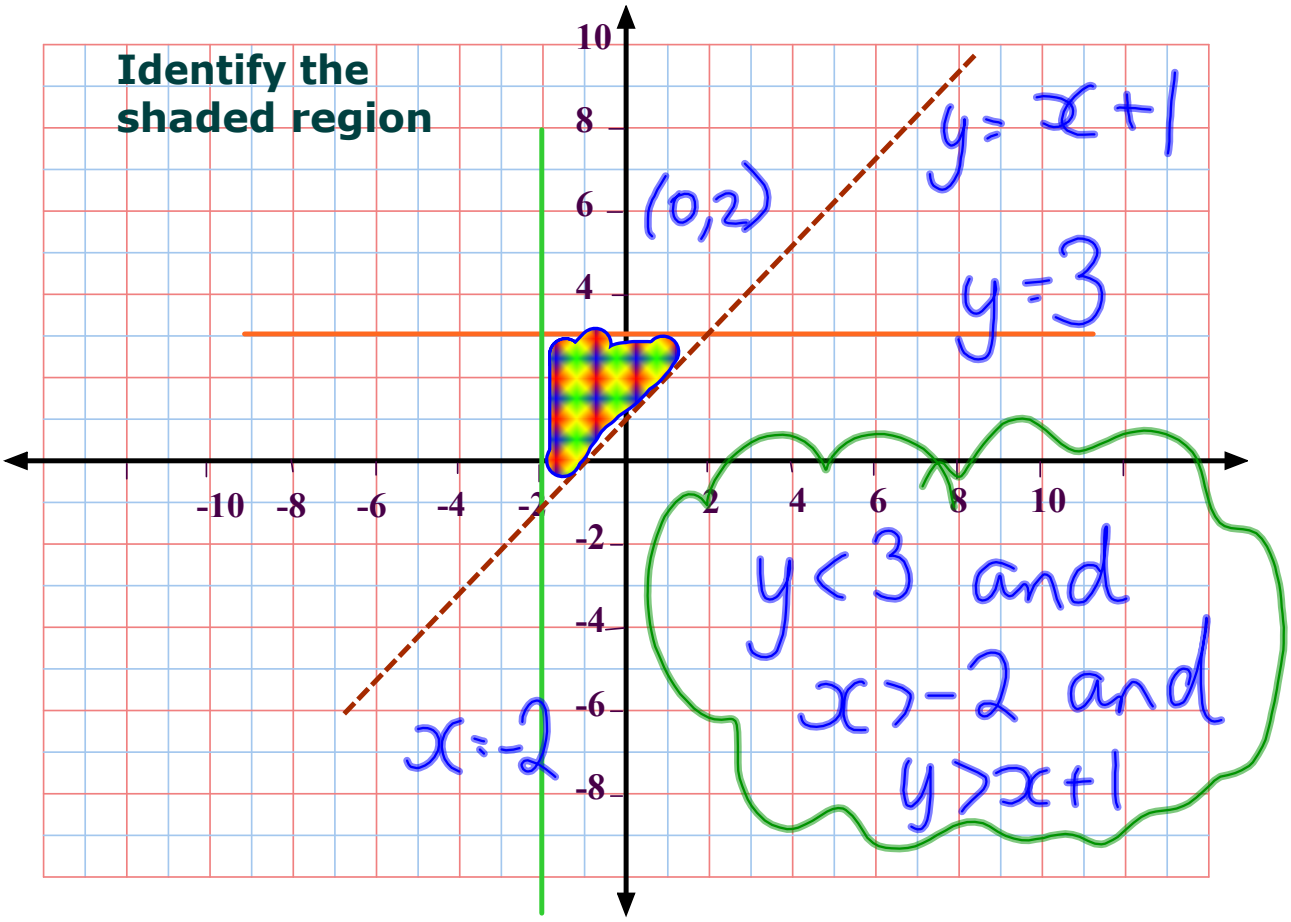
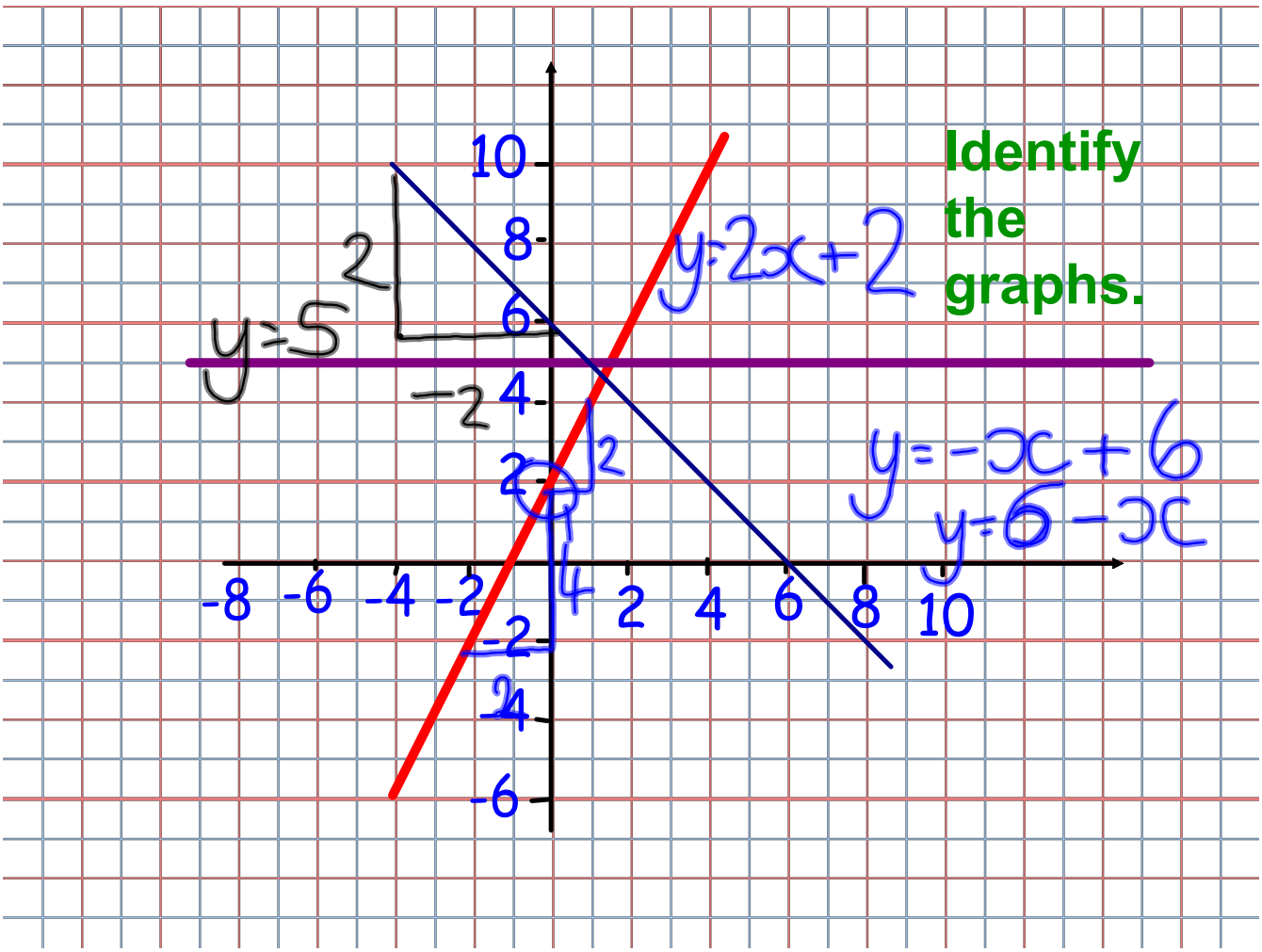
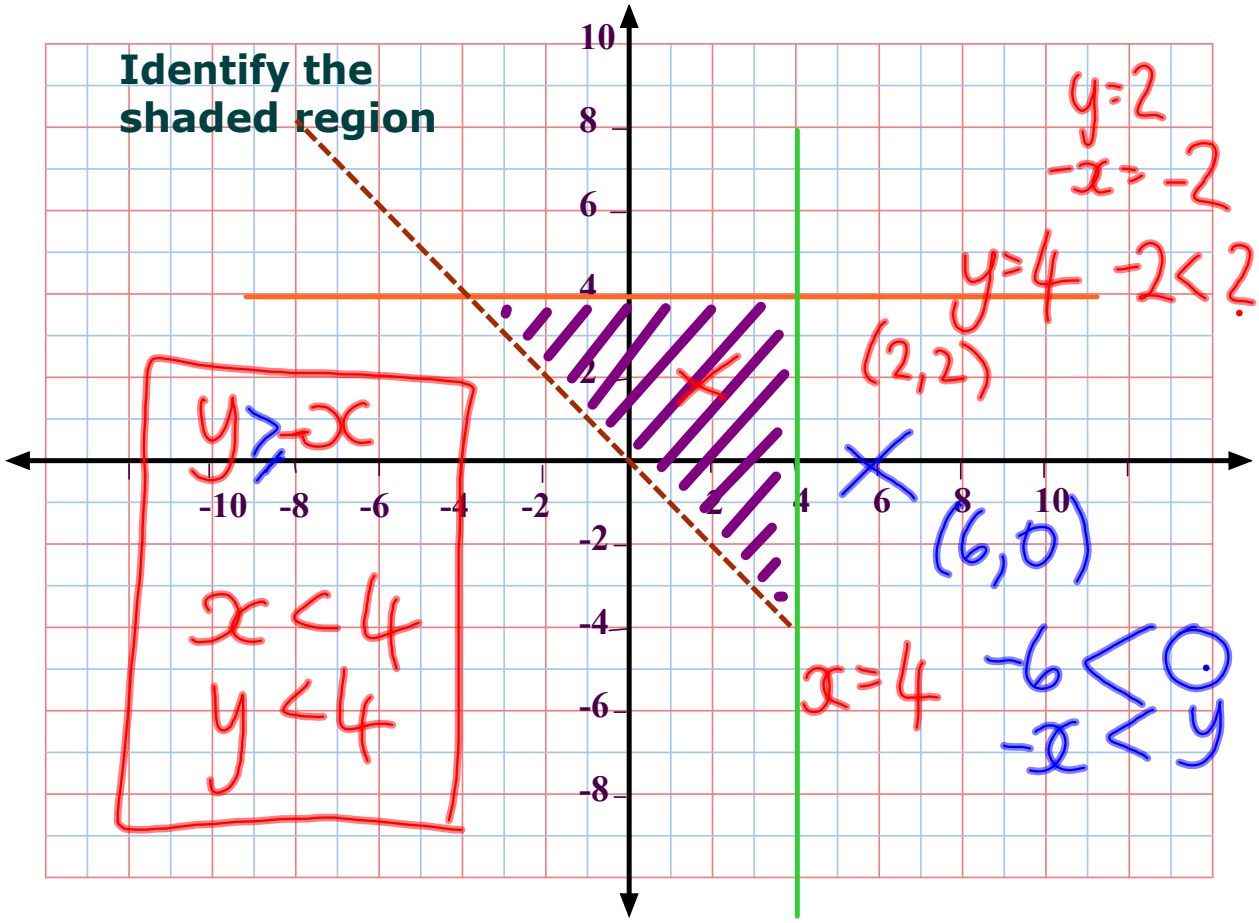
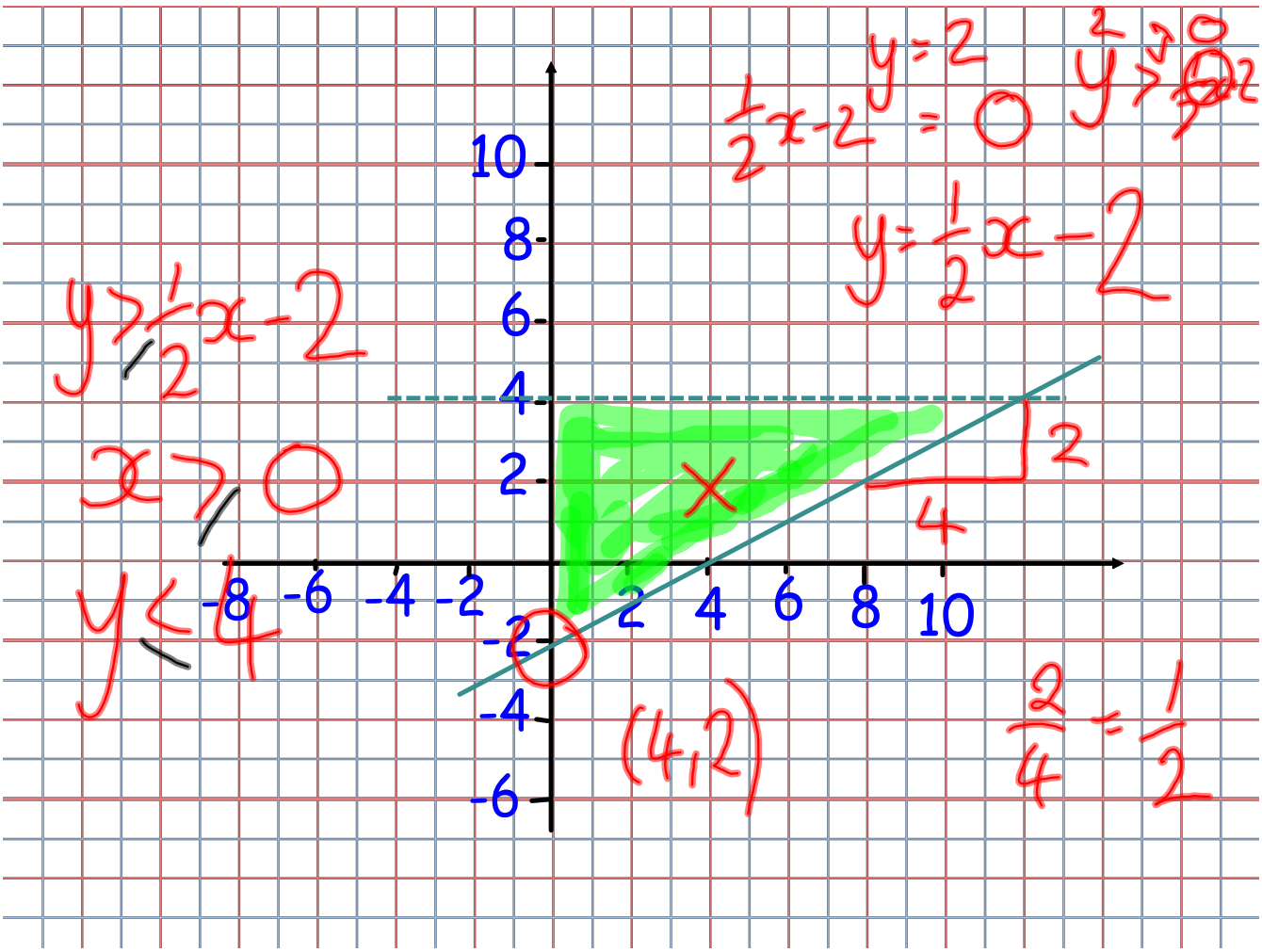
Ext B5

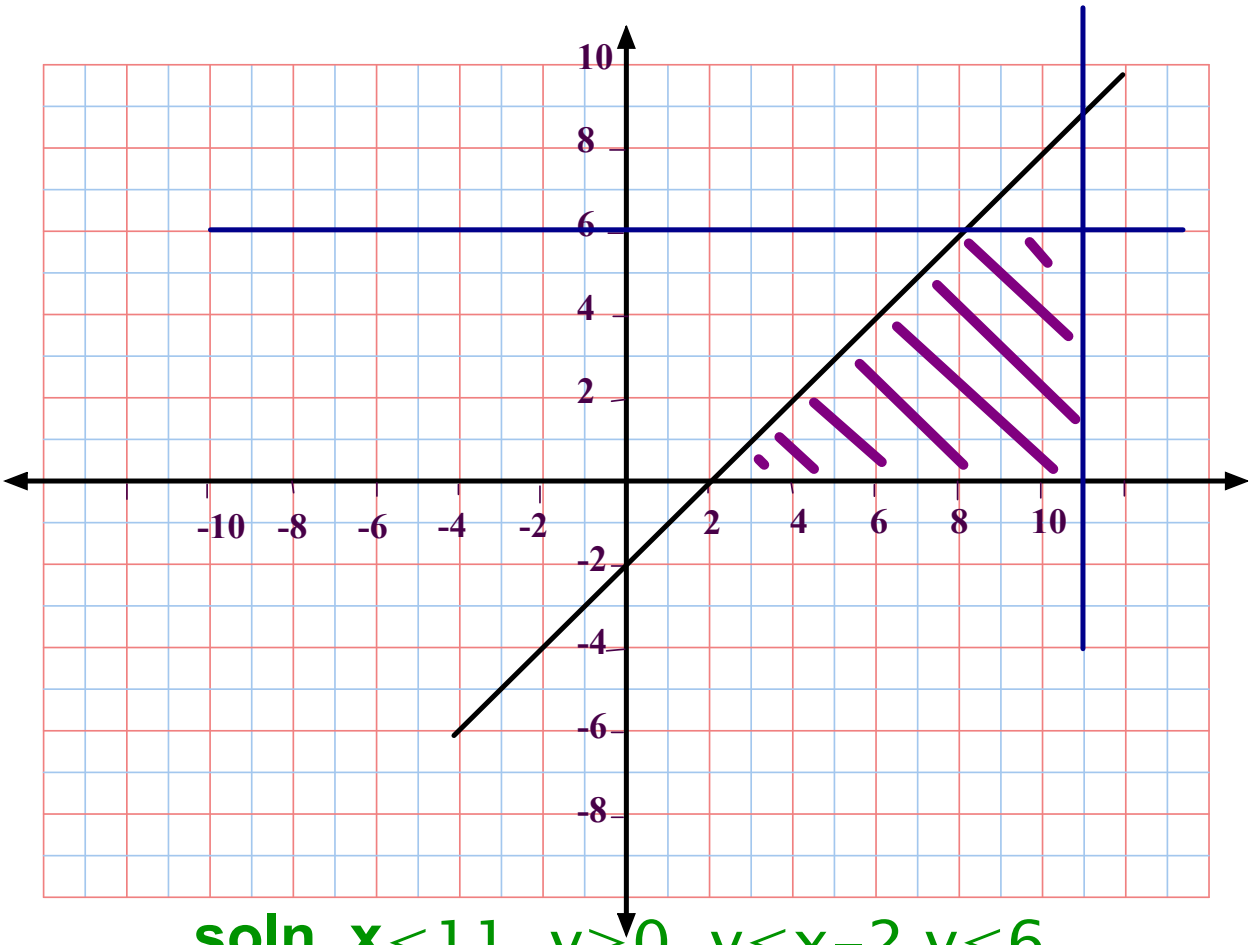

Identify the shaded region
10
8
6
4
-2
-4
-6
-8
-10
-8
-6
-4
2
4
6
8
10
(0,2)
y = x + 1
y = 3
x = -2
y < 3 and
x > -2 and
y > x + 1

for monday


Identify the graphs.
y=5
y=2x+2
y=-x+6
y=6-x
10
8
6
4
2
-2
-8 -6 -4 -2 2 4 6 8 10
-2
-4
-6
2
2
4


Identify the shaded region
y=2
-x=-2
y=4 -2<?
(2,2)
y≥-x
(6,0)
x<4
y<4
x=4
-6<0
-x<y

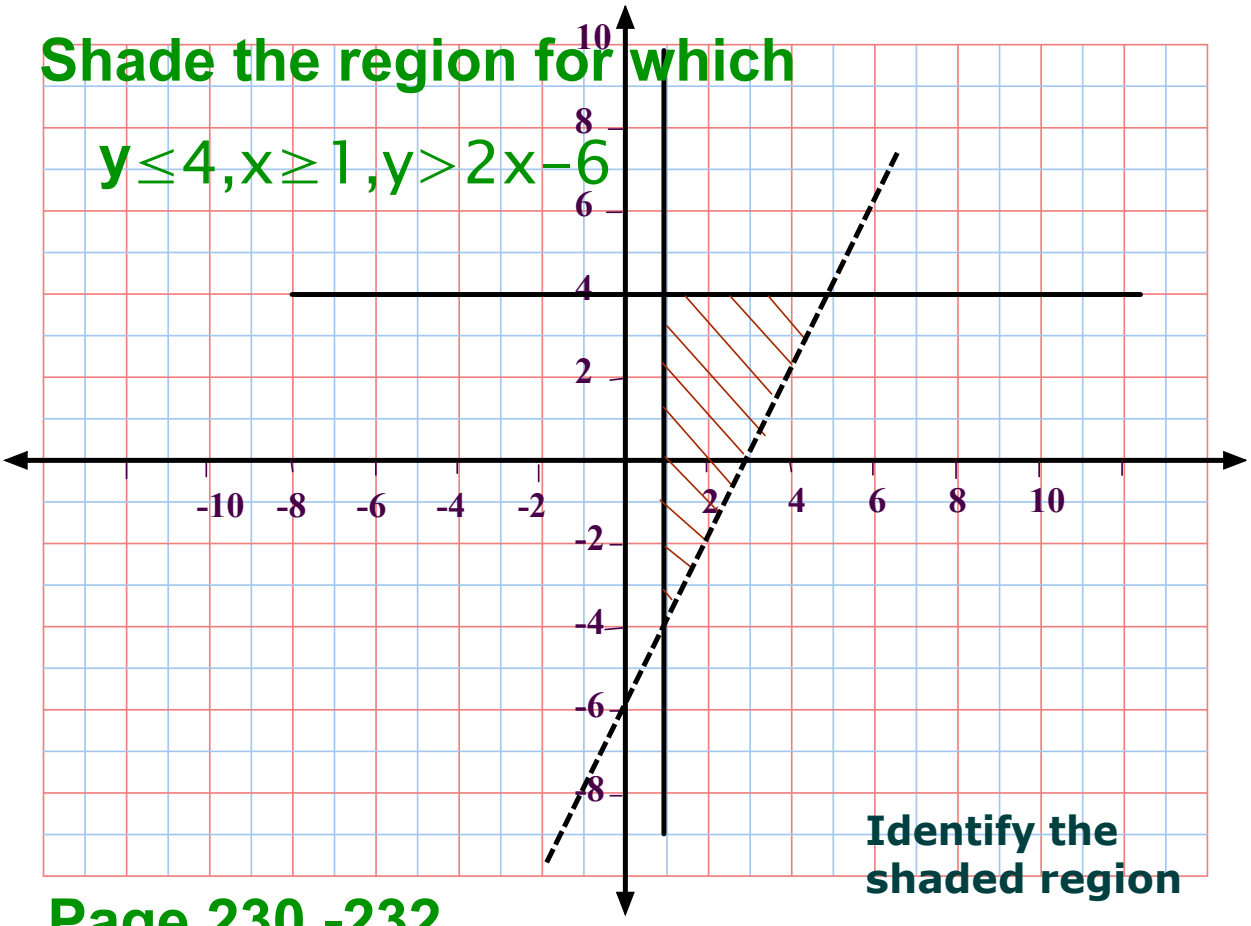

y = 2
y ≥ 2
1/2 x - 2 = 0
y = 1/2 x - 2
y ≥ 1/2 x - 2
x ≥ 0
y ≤ 4
10
8
6
4
2
-8
-6
-4
-2
2
4
6
8
10
-2
-4
-6
2
4
(4,2)
2/4 = 1/2



soln $x \leq 11,\ y \geq 0,\ y \leq x-2, y \leq 6$

Shade the region for which

$y \leq 4, x \geq 1, y > 2x - 6$



Identify the shaded region

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