

**IGCSE higher****Week 5 homework**

1 On the grid at the end of the sheet, draw the following lines

a)  $y = 3x - 1$  and                      b)  $y = -1/2 x + 6$

Hence find the solution to the simultaneous equations

$y = 3x - 1$  and  $y = -1/2 x + 6$

(hint look where the two lines intercept)

2 Solve these pairs of simultaneous equations using the elimination method

a)  $3x - y = 5$

b)  $x + 2y = 1$

c)  $5y + 4x = 7$

d)  $3x - 5y = 10$

e)  $4x - 0.5y = 12.5$

$2x + 5y = 9$

$2x + 3y = 4$

$4y - 5x = 22$

$7x + 3y = 16$

$3x + 0.8y = 8.2$

3 Jim keeps pigeons, they lay either white or brown eggs. On Monday Jim's pigeons lay 3 white eggs and 2 brown eggs weighing 13 ounces. On Tuesday they lay 5 white eggs and 4 brown eggs weighing 24 ounces. Work out the weight of an individual white egg.

4 The wage bill for five builders and six joiners is £1340. While the wage bill for eight builders and three joiners is £1220. Find the individual wage for a builder and a joiner

5 Find the point of intersection of the 2 lines  $3x + y = 10$  and  $2x - 3y = 14$

(hint just solve like normal simultaneous equations)

6 The following Simultaneous Equations are set out differently, solve them by using the substitution method

a)  $y = x + 3$

b)  $x = y - 3$

c)  $2x + 5y = 24$

d)  $3x + 4y = 11$

e)  $5x - 4y = 13$

$y + 2x = 6$

$x + 3y = 5$

$x = 3 + 2y$

$x = 15 - 7y$

$y = 13 - 2x$

7 Using the given grids at the end of the homework plot each pair of lines and find the points of intersection for the equations

a)  $y = 4$

b)  $y = x + 1$

$y = x^2$

$y = x^2 - 2x + 3$

notice there are 2 points of intersection

these are also known as the solutions for each pair of simultaneous equations

8 The following pairs of Simultaneous equations contain one linear and one quadratic equation Solve using the substitution method

like Q 9 you should have 2 solutions for each pair

a)  $y = 2x + 2$

b)  $y = x^2 - 2x$

c)  $y = 7x - 8$

d)  $y = x^2 - 3x + 7$

$y = x^2 - 1$

$y = x + 4$

$y = x^2 - x + 7$

$5x - y = 8$

9 Sketch the graph of  $x^2 + y^2 = 9$  what is the shape of the graph?

10 If  $x = y + 3$  then  $x^2 = (y + 3)^2 \longrightarrow x^2 = (y + 3)(y + 3) \longrightarrow y^2 + 6y + 9$

Find what  $x^2$  is for the following expressions (might have to rearrange)

a) when  $x = y + 5$

b)  $x = y - 7$

c)  $y - x = 2$

d)  $y + x = 8$

e)  $y = 2 - x$

11 Now solve these pairs of simultaneous equations

a)  $y = x + 1$

b)  $x = 2 - 2y$

c)  $y = x - 2$

d)  $x + y = 2$

$x^2 + y^2 = 13$

$x^2 + y^2 = 1$

$x^2 + y^2 = 20$

$3x^2 - y^2 = 1$

12 Find the points of intersection of the 2 lines  $3x + y = 4$  and  $xy = -4$

**13** For all the above simultaneous equation questions, identify which questions are linear, produce only one solution and which are quadratic and produce 2 solutions

Notice the different ways of solving them?

Now look at the exam questions below and by working out whether they are linear or quadratic, work out which way to solve each one.

**14** A cinema sells adult tickets and child tickets

The total cost of 3 adult tickets and 1 child ticket is £30

The total cost of 1 adult tickets and 3 child ticket is £22

Work out the cost of an adult ticket and the cost of a child ticket

**15** Solve algebraically these simultaneous equations

$$y = x^2 + 6x - 5$$

$$y = 2x + 7$$

**16** Solve algebraically these simultaneous equations

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

$$3x - 4y = 18$$

**17** Solve the simultaneous equations

$$x^2 + y^2 = 9$$

$$x + y = 2$$

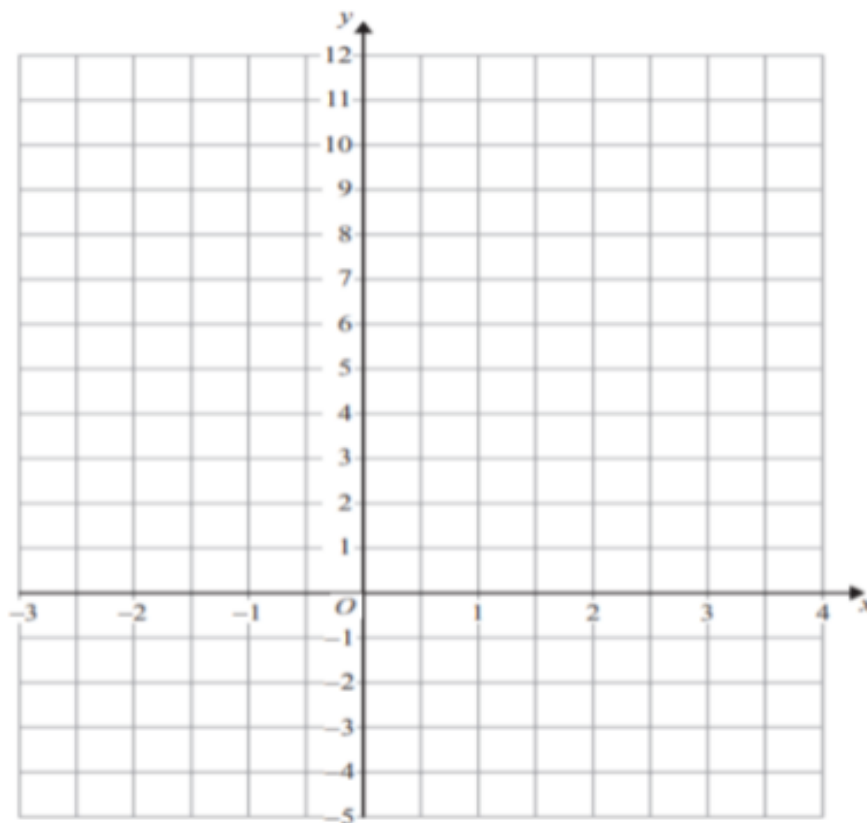
give your answers correct to 2 decimal places

**18** Solve these simultaneous equations algebraically

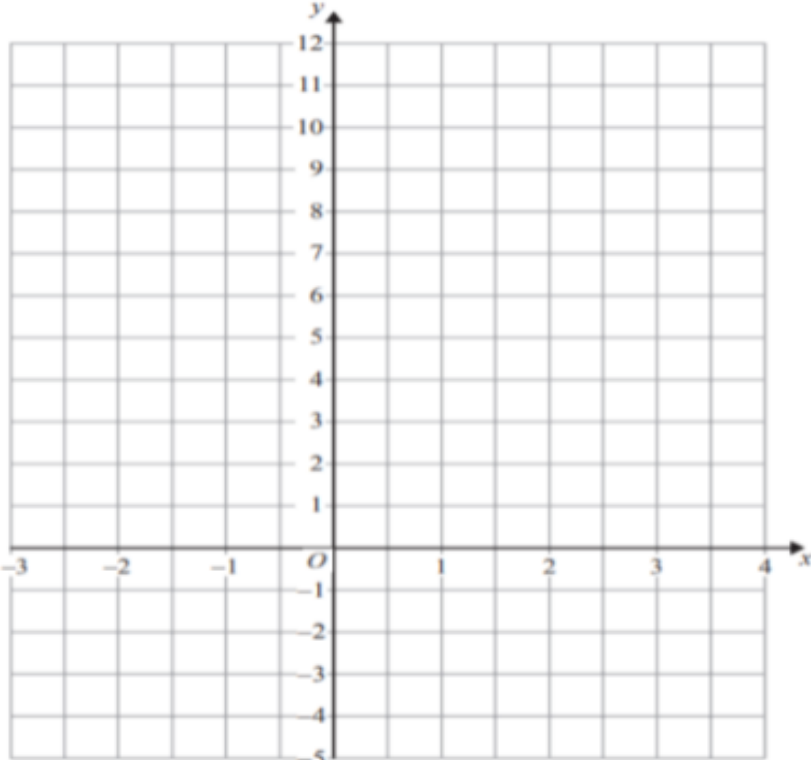
$$y = 2x^2 - 4x + 1$$

$$y = 6 - x$$

For Question 1



For Question 7 a



For Question 7 b

