

# IGCSE Higher Wk 5 homework answers

1, See end graph

2/a) ①  $3x - y = 5$   $\times 5$

②  $2x + 5y = 9$  ) +

①  $\times 5$  ③  $15x - 5y = 25$

$17x = 34$

$x = 2$   $y = 1$

b)  $x = 5$   
 $y = -2$

c)  $y = 3$   
 $x = -2$

d)  $x = 2.5$   
 $y = -0.5$

e) ①  $\times 3 \rightarrow 12x - 1.5y = 37.5$

②  $\times 4 \rightarrow 12x + 3 - 2y = 32.8$

$4.7y = 4.7$

② - ①  
 $y = -1$

$x = 3$

3/ ①  $3w + 2b = 13$

②  $5w + 4b = 24$

$\Rightarrow$  ①  $\times 2$  ③  $6w + 4b = 26$   
③ - ②  $\Rightarrow w = 2$

White = 2 ounces

Brown = 3.5 ounces

4/ Builders = £100

Jones = £140

5/ ①  $3x + y = 10$

②  $2x - 3y = 14$

①  $\times 3 \rightarrow$  ③  $9x + 3y = 30$

③ - ②  $\Rightarrow 11x = 44$

$x = 4$

$y = -2$

point of intersection

$(4, -2)$

6/a) ①  $y = x + 3$

②  $y + 2x = 6$

subs  $y = x + 3$  into ②  $\Rightarrow$

$x + 3 + 2x = 6$

$\Rightarrow 3x = 3$

$x = 1$

$y = 4$

b)  $y - 3 + 3y = 5$

$4y = 8$

$y = 2$   $x = -1$

d) If  $x = 15 - 7y$

then  $3x = 45 - 21y$

• subs into ①

$\therefore 45 - 21y + 4y = 11$

$-17y = -34$

$y = 2$

$x = 1$

e) If  $x = 3 + 2y$

$2x = 6 + 4y$

Subs into ①

$6 + 4y + 5y = 24$

$9y = 18$

$y = 2$

$x = 7$

e) If  $y = 13 - 2x$

$-4y = -52 + 8x$

Subs into ①

$5x - 52 + 8x = 13$

$13x = 65$

$x = 5$

$y = 3$

7, See graphs at end

8, Remember  $y = y$

a)  $x^2 - 1 = 2x + 2$

$x^2 - 2x - 3 = 0$

$(x - 3)(x + 1) = 0$

$x = 3$  or  $-1$

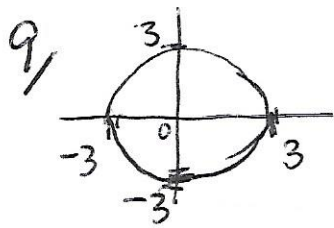
$y = 8$  or  $0$

b)  $x = -1$  or  $+4$

$y = 3$  or  $8$

c/  $x = 5$  or  $3$   
 $y = 27$  or  $13$

d/ Rearrange (2) to get  $y = 5x - 8$   
 then  $x^2 - 3x + 7 = 5x - 8$   
 $x^2 - 8x + 15 = 0$   $(x-5)(x-3)$   
 $x = 5$  or  $3$   
 $y = 17$  or  $7$



circle [remember  $x^2 + y^2 = r^2$ ]

10/ a/  $x^2 = y^2 + 10x + 25$     b/  $x^2 = y^2 - 14y + 49$     c/  $x^2 = y^2 - 4x + 4$   
 d/  $64 - 16y + y^2$     AN

11/ a/  $y^2 + (x^2 + 2x + 1)$  substitute into  $x^2 + y^2 = 13$   
 to give  $x^2 + x^2 + 2x + 1 = 13$   
 $2x^2 + 2x - 12 = 0 \div 2$   
 $x^2 + x - 6 = 0$   
 $(x+3)(x-2)$

$x = -3$  or  $2$   
 $y = -2$  or  $3$

b/  $y = 1$  or  $0.6$   
 $x = 0$  or  $0.8$

c/  $x = -2$  or  $4$   
 $y = -4$  or  $2$

d/ have to use quad formula  
 $x = -2.87$  or  $0.87$   
 $y = 4.87$  or  $1.13$

12/ rearrange (1)  $3x + y = 4 \Rightarrow y = 4 - 3x$  now substitute into (2)  
 $x(4 - 3x) = -4$   
 $4x - 3x^2 = -4 \Rightarrow 3x^2 - 4x - 4 = 0$   $x = \frac{2}{3}$  or  $2$   
 $(3x+2)(x-2) = 0$   $y = 6$  or  $-2$

13/ Linear Q1 Q2 Q3 Q4 Q5 Q6  
 Quadratic Q7 Q8 Q11 Q12

14/ (1)  $3a + 1c = 30$   $\times 3$   
 (2)  $1a + 3c = 22$   $\downarrow$   
 (3)  $9a + 3c = 90$

15/  $x^2 + 6x - 5 = 2x + 7$   
 $x^2 + 4x - 12 = 0$   
 $(x+6)(x-2) = 0$   
 $x = -6$      $x = 2$   
 $y = -5$      $y = 11$

(3)-(2)  $8a = 68$   
 $a = \pounds 8.50$   
 $c = \pounds 4.50$

16, ①  $2x+3y = \frac{2}{3} \times 3 \Rightarrow$  ③  $6x+9y=2$  - ③ - ④  
 ②  $3x-4y=18 \times 2 \Rightarrow$  ④  $6x-8y=36$   
 $+17y = -34 \quad y = -2 \quad x = 3\frac{1}{3}$

17, ①  $x^2+y^2=9$   
 ②  $x+y=2$   
 $\Downarrow$   
 $y=2-x$   
 $y^2 = x^2 - 4x + 4$  subs into ①

$x^2 + x^2 - 4x + 4 = 9$   
 $2x^2 - 4x - 5 = 0$   
 can't factorise

formula  
 $x = \frac{4 \pm \sqrt{16 - 4 \times 2 \times -5}}{4}$

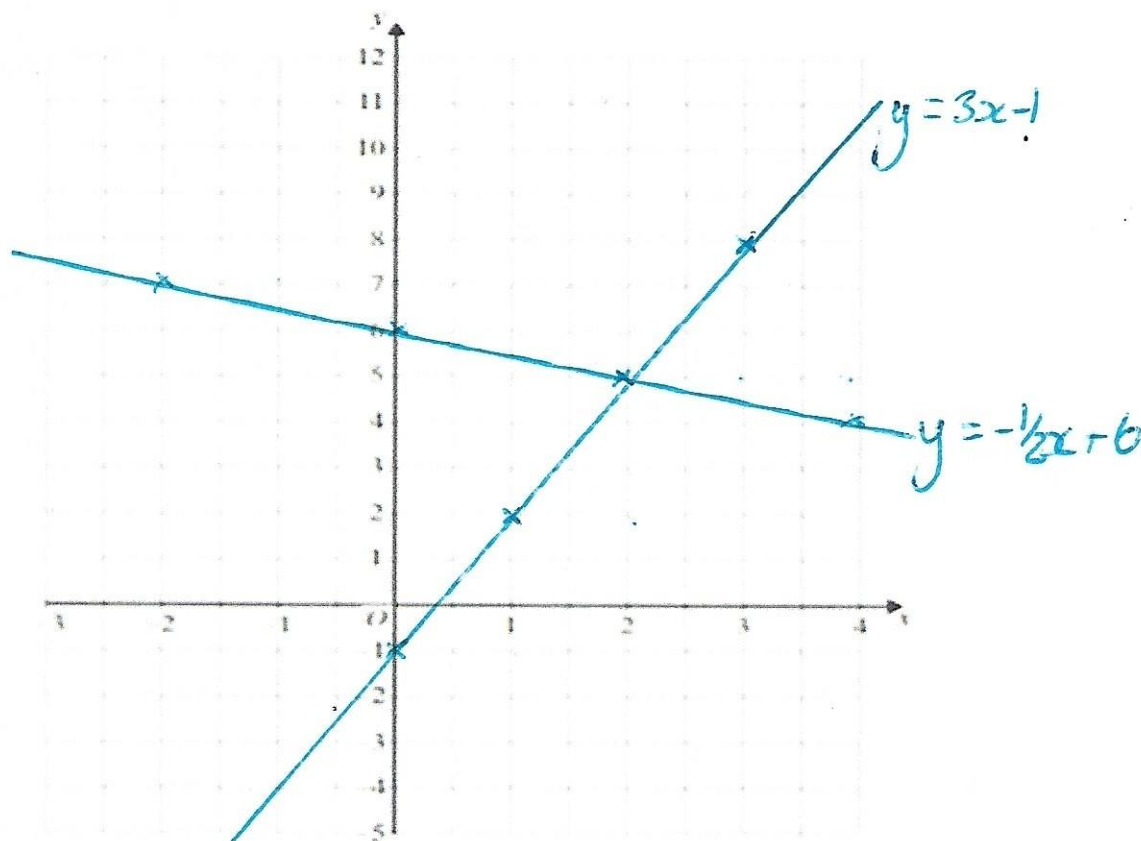
$x = 2.87 \quad x = -0.87$   
 $y = -0.87 \quad y = 2.87$

18,  $2x^2 - 4x + 1 = 6 - x$   
 $2x^2 - 3x - 5 = 0$   
 $(2x-5)(x+1) = 0$

$x = \frac{5}{2}$  or  $x = -1$   
 $(2-5)$   
 $y = 3.5$  or  $y = 7$

For Question 1

Solution  
 $x = 2$   
 $y = 5$

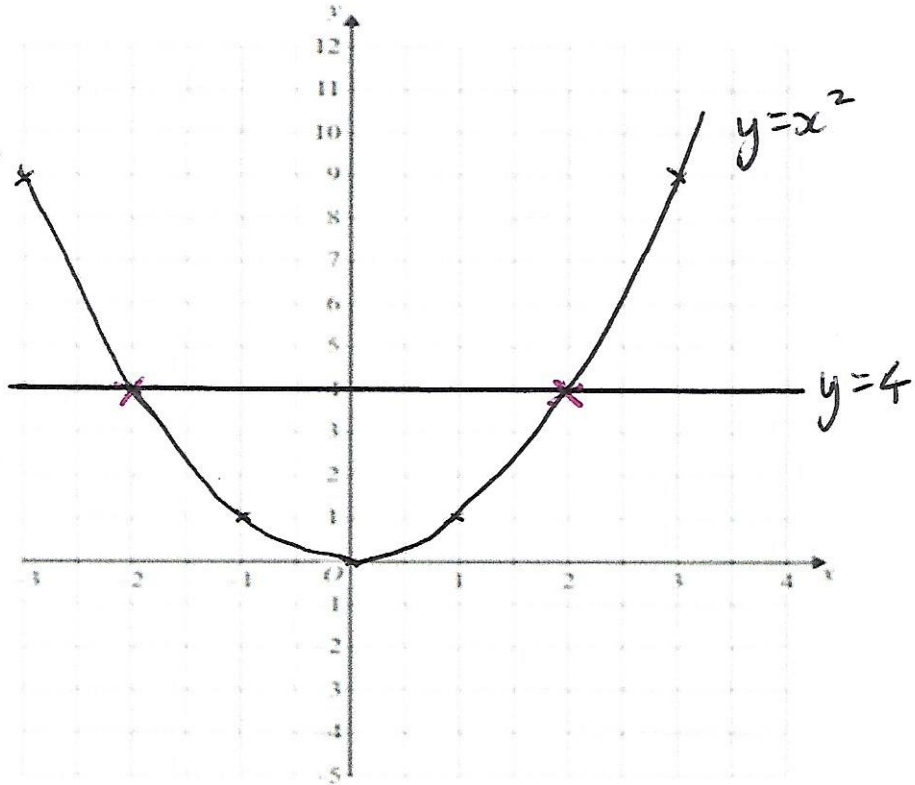


For Question 7 a

points of intersection  
are solutions

$$x = -2 \text{ k } x = 2$$

$$y = 4 \text{ k } y = 4$$



For Question 7 b

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

$x$	-1	0	1	2	3
$y$	6	3	2	3	6

Solutions

$$x = 1 \text{ k } x = 2$$

$$y = 2 \text{ k } y = 3$$

