Task 1 Equivalent Equations – Fill in the gaps

$12x + 9 = \Box$	$4x = \Box$	$8x + 6 = \Box$	$8x + 6y = \Box$	$60 = \Box x + 12y$	$15y = \Box - 20x$
$4x - 3 = \Box$	$4x + 3 = 15$	$3 = \Box - 4x$	$3y = \Box - 4x$	$4x + 3y = 15$	$4x = 15 - \Box y$
$x = \Box$	$2x + 1.5 = \Box$	$4xy + \Box = 15y$	$0.4x + \Box y = \Box$	$\Box x + \Box y = 45$	$x + \Box y = 3.75$

$\Box x - 8 = 40$	$\Box - 3x = -10$	$\Box = 10 - 3x$	$3x = 2y + \Box$	$\Box x - \Box y = 20$	$2y = \Box x - \Box$
$12 - \Box x = -60$	$3x - 2 = 10$	$3x = \Box$	$9x - \Box y = \Box$	$3x - 2y = 10$	$3x - 2y + 4 = \Box$
$3x + 2 = \Box$	$x = \Box$	$6x - \Box = 20$	$3x^2 - 2xy = \Box x$	$100 = \Box x - \Box y$	$y = \Box x - \Box$

$2.5 - x = \Box$	$-2x = \Box$	$\Box + 2x = 5$	$\Box = 2x + 25y$	$10 - \Box x = \Box y$	$100y = \Box - \Box x$
$\Box x - 15 = -75$	$5 - 2x = 25$	$\Box - 4x = 50$	$1 - \Box x = \Box y$	$5 - 2x = 25y$	$6x + \Box y = \Box$
$\Box - 8x = 100$	$\Box = 10 - 2x$	$x = \Box$	$x = \Box - \Box y$	$5y - 2xy = \Box y^2$	$\Box - 2x = 25y + 3$

$x = 5, y = \Box$	$x = -3, y = \Box$	$x = \Box, y = 4$	$\Box y = 15x + \Box z$	$x = \Box y - \Box z$	$16y - \Box z = \Box x$
$x = 0.2, y = \Box$	$y = 5x - 6$	$x = \Box, y = 0$	$6(x + \Box z) = \Box y$	$4y = 5x + 10z$	$y = \Box x + \Box z$
$\Box = 10x - 2y$	$y - 5x = \Box$	$x = \Box y + \Box$	$\Box x = 4(\Box y - 5z)$	$z = \Box y - \Box x$	$2y - \Box x - 5z = \Box$

Task 2 Either find the value of x, or explain why it is impossible to do so.

a. $7x - 14 = 7$	
b. $7x - 14y = 7$	
c. $7x - 14 = 7x$	
d. $7x - 14 = -7x$	
e. $7x - 14 = 7(x - 2)$	
f. $7x - 14 = 2(x - 7)$	
g. $7x - 14 = 2(y - 7)$	
h. $7x - 14y = 2(21 - 7y)$	
i. $x^2 - 2x + 14 = 7x$	
j. $(x - 2)(y - 7) = 0$	
k. $7x + c = 14$	
l. $(x - y - 3)^2 + (x + y - 7)^2 = 0$	

Task 3   Solving with substitution

Solve $4x + 2y = 36$ when $x = 10$ $\begin{aligned} 4{\times}10 + 2y &= 36 \\ 40 + 2y &= 36 \\ 2y &= -4 \\ y &= -2 \end{aligned}$	Solve $4x + 2y = 36$ when $x = -10$	Solve $4x + 2y = 36$ when $y = -10$
Solve $4x + 2y = 36$ when $y = 10$	Solve $4x - 2y = 36$ when $y = 10$	Solve $4x - 2y = 36$ when $y = -10$
Solve $4x - 2y = 36$ when $y = -1$	Solve $4x - 2y = 36$ when $x = -1$	Solve $4x - 2y = 36$ when $x = 1$
Solve $-4x + 2y = 36$ when $x = 1$	Solve $-4x + 2y = 36$ when $y = 1$	Solve $-4x + 2y = 36$ when $x = -1$
Solve $-4x + 2y = 36$ when $y = -1$	Solve $-4x - 2y = 36$ when $y = -1$	Solve $4x + 2y = -36$ when $y = -1$

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Task 6 Solving Simultaneous Equations - 1

$a + b = 13$ $a - b = \ 5$ **$2a \quad = 18$** **$a \quad = \ 9$** **$b = 13 - 9 = 4$**	$c + d = 26$ $c - d = 14$	$e + f = 27$ $e - f = 13$
$g + h = 53$ $g - h = 5$	$i + j = 12$ $i - j = 9$	$k + l = 40$ $k - l = 1$
$m + n = 7$ $m - n = 0$	$p + q = 10\frac{1}{2}$ $p - q = 3\frac{1}{2}$	$2r + s = 5$ $r - s = 1$
$4t + u = 22$ $t - u = 3$	$5v + w = 36$ $v - w = 6$	$8x + y = 66$ $x - y = 6$
$4z + A = 18$ $z - A = 7$	$B + 2C = 10$ $3B - 2C = 6$	$5D + 3E = 51$ $2D - 3E = 12$

-2	1	1	1.5	2	2	2	2	3	3.5	3.5	3.5	4	4	5
												b		

5	6	7	7	7	8	9	9	10.5	19.5	20	20	20.5	24	29
						a								

Task 7 Find the lengths of the planks, and the heights of the children and giraffes:

(a)	(b)	(c)	(d)
The combined length of two planks is 10 m and one is 4 m longer than the other.	The combined length of two planks is 11 m and one is 3 m longer than the other.	The combined length of two planks is 12 m and one is 5 m longer than the other.	The combined length of two planks is 15 m and one is 23 m longer than the other.

(e)	(f)	(g)	(h)
The combined height of the child and giraffe is 7 ft and there is a 3 ft gap in their heights.	The combined height of the child and giraffe is 8 ft and there is a 2 ft gap in their heights.	The combined height of the child and giraffe is 8 ft and there is a 3 ft gap in their heights.	The combined height of the child and giraffe is 10 ft and there is a 3 ft gap in their heights.

Task 8 Solving Simultaneous Equations - 2

$2a + b = 30$ $3a + b = 39$ $a = 39 - 30 = 9$ $b = 30 - 2×9 = 12$	$5c + d = 38$ $2c + d = 23$	$4e + f = 39$ $3e + f = 32$
$5g + 3h = 38$ $2g + 3h = 26$	$3i + 4j = 8$ $5i - 4j = 8$	$k + 4l = 26$ $k + 2l = 20$
$5m + 4n = 32$ $m + 4n = 0$	$3p + 2q = 23$ $21p - 2q = 1$	$2r + 9s = 3$ $2r - 3s = 39$
$t + 2u = 49$ $t - u = 1$	$6v + 7w = -3$ $8v - 7w = -4$	$7x + 3y = 19$ $3y + 5x = 29$
$A + 3z = 7$ $3z - A = 2$	$7B - 3C = 5$ $C = 4B$	$D - 3E = 40$ $2D - 7E = 60$

-5	-4	-3	-2	-1	-0.5	0	0.5	1	1.5	2	2.5	3	4	5

6	7	8	9	10	11	12	13	14	15	16	17	18	20	100

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Task 10 Solving Simultaneous Equations - 3

$5a + 2b = 34$ $3a + 4b = 40$	$3c + 2d = 30$ $5c - 4d = 28$	$e + 2f = 24$ $3e + \ f = 47$
$3g - 2h = 21$ $g + 6h = 47$	$3j = 4i$ $j = 2i - 6$	$5k + \ l = 23$ $7k + 2l = 40$
$4m + 7n = 39$ $m + 2n = 9$	$2p + \ 4q = 4$ $10p + 21q = 16$	$2r - \ 7s = 25$ $3r + 14s = 34$
$5u = 2t$ $3t - 10u = 5$	$3v + 5w = 10$ $6v + 4w = 17$	$3x + \ 5y = 21$ $4x - 10y = 3$
$5z - \ 4A = 2$ $7z - 20A = 10$	$4C = 9 - 5B$ $15B + 8C = 13$	$3D + 2E = 40$ $3E + 2D = 10$

-10	-5	-4	-3	-2	-1	-0.5	0	0.5	1	1.5	2	2.5	3	3.5

4	4.5	5	6	7	8	9	10	11	12	13	14	15	16	20

$3a + 5b = 7$ $4a + 7b = 10$	$3c + 5d = 9$ $2c + 7d = 17$	$5e + 2f = 8$ $7e + 3f = 11$
$2g + 3h = 8$ $3g + 7h = 17$	$3i + 4j = 18$ $2i - 3j = -5$	$3k + 8l = 13$ $8k + 5l = 2$
$3m - 2n = 0$ $4m - 3n = 1$	$5p + 3q = 9$ $7p + 2q = 17$	$3r - 2s = -1$ $5r + 3s = 11$
$8t + 5u = 11$ $3t + 7u = -1$	$3v + 7w = 19$ $-2v + 3w = 18$	$7x + 2y = 16$ $5y - 6x = -7$
$7z + 2A = 22$ $8z - 3A = 41$	$2B + 3C = -12$ $-7B + 4C = 13$	$-3E = 4D - 10$ $5D + 4E = 13$

-3	-2	-1	3

1	2	4

(1)

33cm

13cm

(2)

30cm

23cm

(3)

23cm

14cm

(4)

19cm

21cm
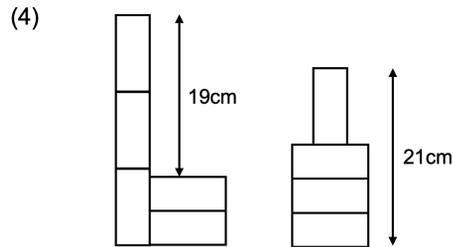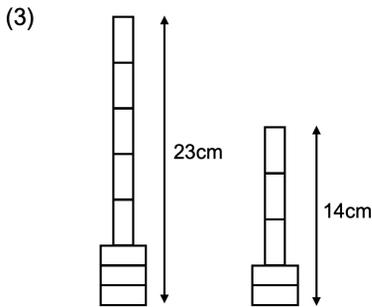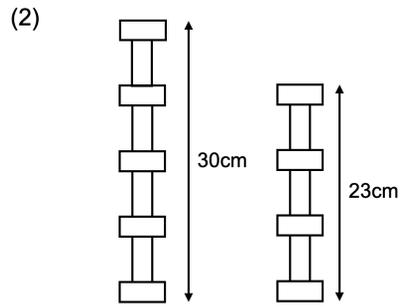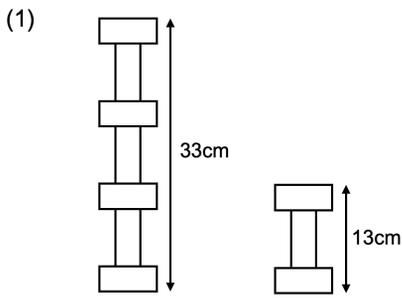
Task 14 Spot the errors Jim and Pam made in their solutions to the problems below.

Omitted Task

Task 15 Solve the following problems algebraically

At a concert, 3 adult and 4 child tickets cost £23. 1 adult and 5 child tickets cost £15. Work out the cost each type of ticket.	Alex bought 3 tins of paint and 4 brushes for £23. Brian bought 2 tins of paint and 3 brushes for £16. Calculate the price of each individual item.
Kate buys 2 lollies and 5 choc ices for £6.50. Pete buys 2 lollies and 3 choc ices for £4.30. Work out the cost of one lolly in pence.	There are 13 coins, either 50p or 20p. They total £4.40 How many of each are there?

Task 16 Where do the lines meet? Solve graphically and algebraically
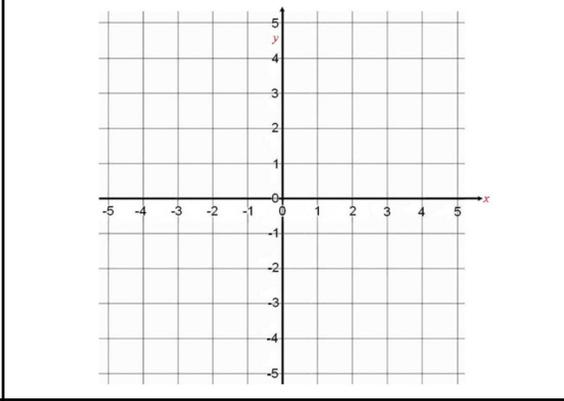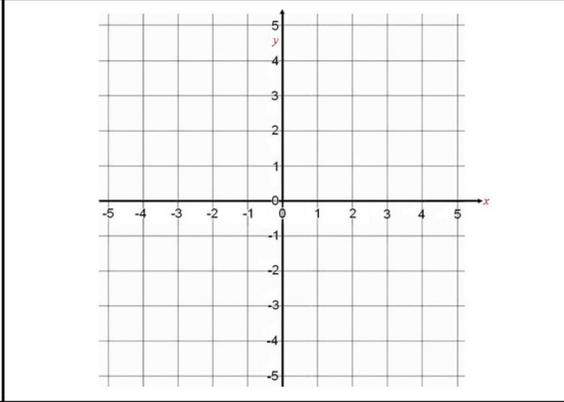
$y = 2x + 4$ $y = x + 1$		
$y = x + 4$ $y = -x + 2$		
$y = 3x + 4$ $y = -x - 4$		
$y = -4x - 1$ $y = x + 4$		
$y = -1\frac{1}{2}x$ $y = \frac{1}{2}x + 4$		
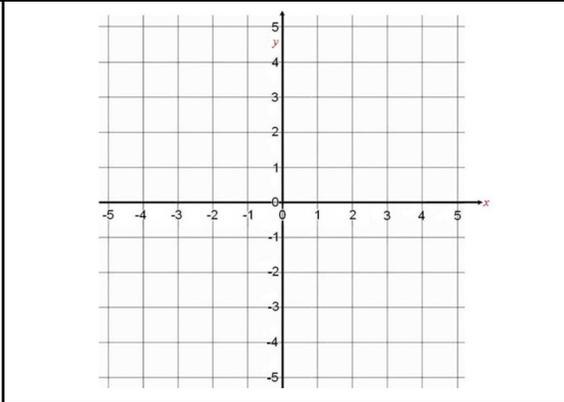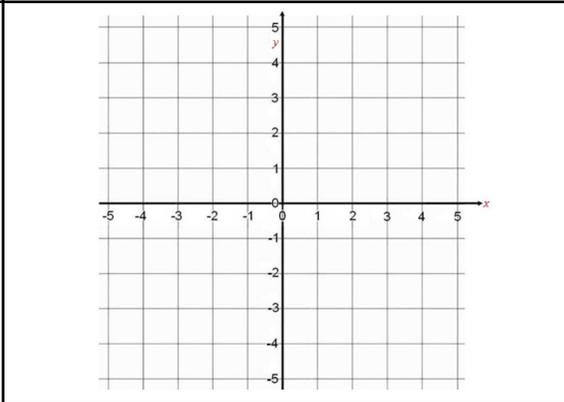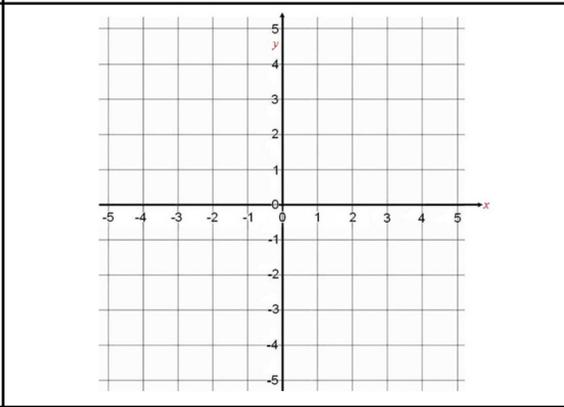
Task 17 Solve the simultaneous equations graphically
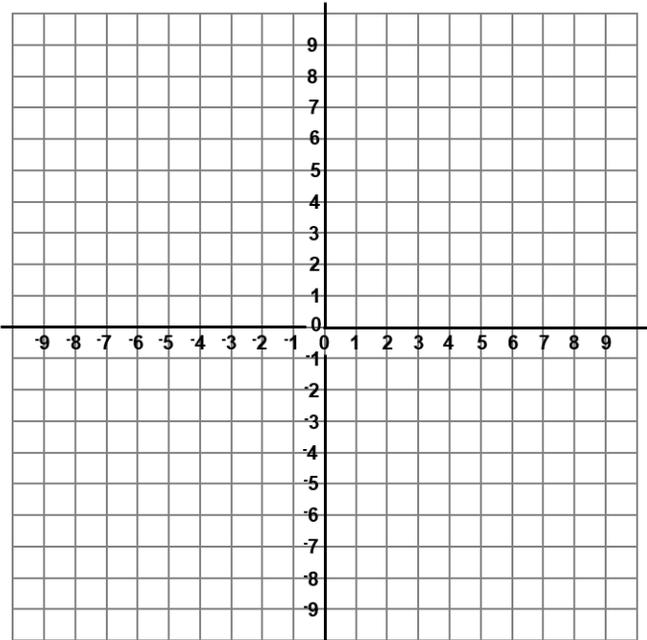
(1) $2x - y = 7$
   $y - x = -1$
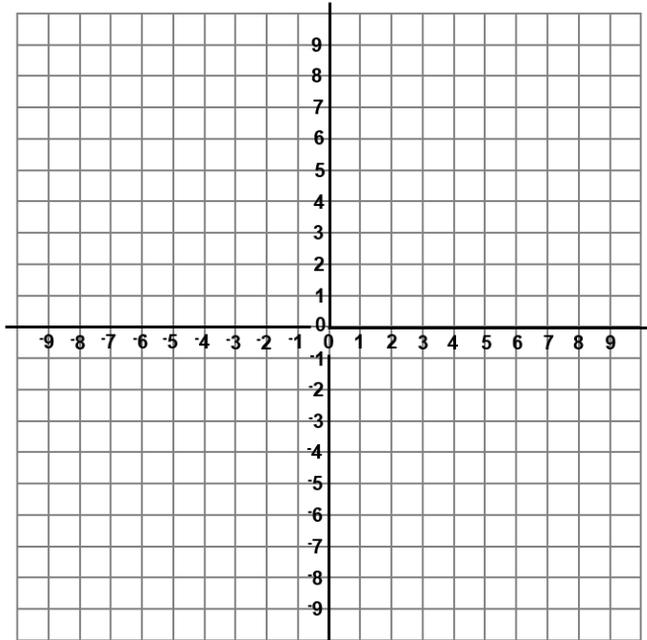
(2) $-2x + y = 3$
   $x + y = 9$

(3) $y - x = 3$
   $2x + y = 6$

(4) $y + 2x = -7$
   $y - x = -1$
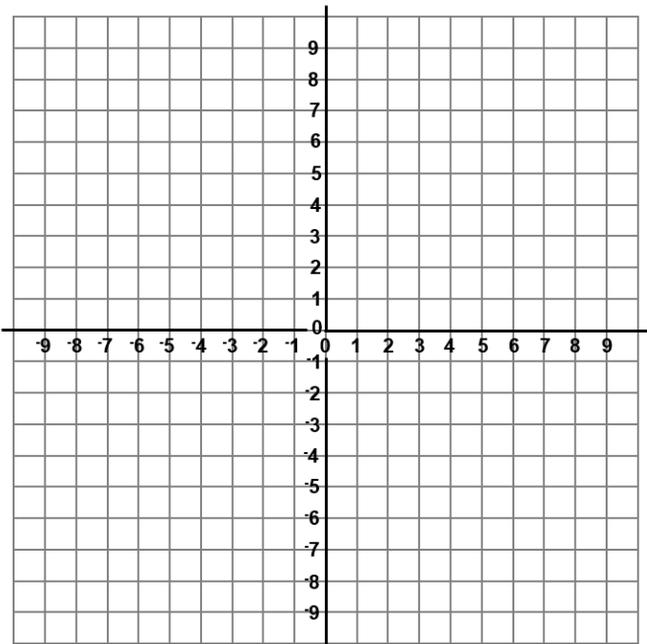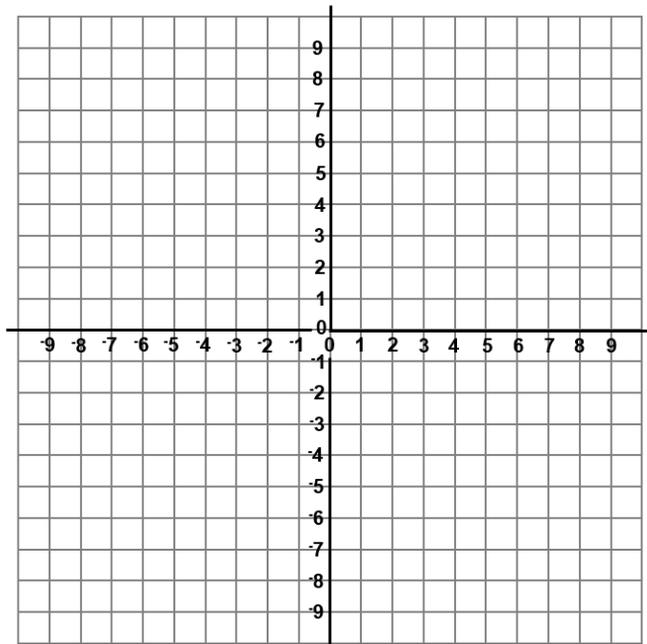
Task 18 Solve each of the following algebraically

$9x + y = 39$ $x + 9y = 31$	$3x + 7y = 53$ $7x + 3y = 57$
$33x + 67y = 333$ $67x + 33y = 367$	$732x + 268y = 2732$ $268x + 732y = 2268$