

Simultaneous Equations Sudoku

c	f	m		h		19	
	e				e	10	
		m					
		k	g	m	c	23	
g			p			11	
				h	f	14	
	g			m		13	
	a		e		k	h	11
k		c	f	a		22	
17	19	16	5	22	14	16	14

a c e f g h k m p (unknowns) Equation No.

Equations

$$\begin{aligned}
 c + h + m &= 19 & (1) \\
 e + f &= 10 & (2) \\
 c + g + k + m &= 23 & (3) \\
 g + p &= 11 & (4)
 \end{aligned}$$

$$\begin{aligned}
 f + h &= 14 & (5) \\
 g + m &= 13 & (6) \\
 a + e + h + k &= 11 & (7) \\
 a + c + p + k &= 22 & (8) \\
 c + g + k &= 17 & (9) \\
 a + f + g &= 19 & (10) \\
 c + k + m &= 16 & (11) \\
 e + p &= 5 & (12) \\
 f + g + m &= 22 & (13) \\
 a + h + m &= 14 & (14) \\
 c + e + h + k &= 16 & (15) \\
 f + h &= 14 & (16)
 \end{aligned}$$

- (1) Use colours to represent the unknowns.
- (2) Write down the equations. total: 16
- (3) Use substitution and elimination methods to solve the equations.

eq (9) and (3):  $(c+g+k)+m=23$   
 $c+g+k=17$   
 $\therefore m=23-17$   
 $=6$

eq (6):  $g+m=13$   
 $13-m=g$   
 $\therefore g=7$

eq (4)  $g+p=11$   
 $p=11-7$   
 $p=4$   
 eq (12)  
 $e+p=5$   
 $e=5-4$   
 $e=1$

My solutions so

a	c	e	f	g	h	k	m	p
3	8	1	9	7	5	2	6	4

eq (2):  $f+e=10$

$f=10-1$

$f=9$

eq (16), (5)

$f+h=14$

$h=14-9$

$h=5$

eq (13):  $a+f+g=19$

$a=19-9-7$

eq (1):  $c+h+m=19$   
 $a=3$   
 $c=19-5-6$   
 $c=8$

Through eliminations, I deduce that k is 2

Check  
 eq (11)  $c+k+m$   
 $k=16-8-6$   
 $k=2$