

# Mathemals Sheet 151

$$\begin{aligned}
 \text{Owl} + \text{Rabbit} + \text{Rabbit} + \text{Tree} &= 17 \\
 \text{Tree} + \text{Tree} + \text{Owl} &= 19 \\
 \text{Owl} + \text{Rabbit} &= 9 \\
 \text{Rabbit} = \quad \text{Owl} = \quad \text{Tree} =
 \end{aligned}$$

$$\begin{aligned}
 \text{Snail} + \text{Cat} + \text{Cat} &= 25 \\
 \text{Snail} + \text{Snail} + \text{Fish} + \text{Cat} &= 28 \\
 \text{Snail} + \text{Cat} &= 17 \\
 \text{Cat} = \quad \text{Snail} = \quad \text{Fish} =
 \end{aligned}$$

$$\begin{aligned}
 \text{Owl} + \text{Fish} + \text{Fish} &= 10 \\
 \text{Mushroom} + \text{Owl} &= 10 \\
 \text{Owl} + \text{Mushroom} + \text{Fish} + \text{Fish} &= 14 \\
 \text{Owl} = \quad \text{Mushroom} = \quad \text{Fish} =
 \end{aligned}$$

$$\begin{aligned}
 \text{Octopus} + \text{Frog} + \text{Frog} &= 11 \\
 \text{Fish} + \text{Octopus} + \text{Octopus} + \text{Frog} &= 15 \\
 \text{Fish} + \text{Octopus} &= 7 \\
 \text{Octopus} = \quad \text{Fish} = \quad \text{Frog} =
 \end{aligned}$$

$$\begin{aligned}
 \text{Snail} + \text{Cat} &= 13 \\
 \text{Cat} + \text{Snail} + \text{Octopus} + \text{Octopus} &= 23 \\
 \text{Cat} + \text{Cat} + \text{Cat} + \text{Snail} &= 25 \\
 \text{Cat} = \quad \text{Snail} = \quad \text{Octopus} =
 \end{aligned}$$

$$\begin{aligned}
 \text{Frog} + \text{Butterfly} + \text{Butterfly} &= 13 \\
 \text{Butterfly} + \text{Tree} + \text{Tree} &= 12 \\
 \text{Frog} + \text{Butterfly} + \text{Butterfly} + \text{Tree} &= 16 \\
 \text{Butterfly} = \quad \text{Frog} = \quad \text{Tree} =
 \end{aligned}$$

$$\begin{aligned}
 \text{Mushroom} + \text{Owl} + \text{Owl} &= 16 \\
 \text{Octopus} + \text{Octopus} + \text{Mushroom} &= 14 \\
 \text{Mushroom} + \text{Owl} + \text{Owl} + \text{Octopus} &= 21 \\
 \text{Owl} = \quad \text{Mushroom} = \quad \text{Octopus} =
 \end{aligned}$$

$$\begin{aligned}
 \text{Owl} + \text{Cat} &= 14 \\
 \text{Owl} + \text{Cat} + \text{Cat} + \text{Mushroom} &= 26 \\
 \text{Cat} + \text{Cat} + \text{Cat} + \text{Owl} &= 30 \\
 \text{Cat} = \quad \text{Owl} = \quad \text{Mushroom} =
 \end{aligned}$$

# Mathemals Sheet 152

$$\text{fish} + \text{octopus} + \text{cat} + \text{cat} = 27$$

$$\text{fish} + \text{fish} + \text{fish} + \text{cat} = 20$$

$$\text{octopus} + \text{fish} = 11$$

$$\text{fish} = \text{octopus} = \text{cat} =$$

$$\text{butterfly} + \text{butterfly} + \text{owl} + \text{tree} = 13$$

$$\text{tree} + \text{tree} + \text{tree} + \text{butterfly} = 6$$

$$\text{butterfly} + \text{tree} = 4$$

$$\text{tree} = \text{butterfly} = \text{owl} =$$

$$\text{snail} + \text{frog} + \text{frog} = 15$$

$$\text{snail} + \text{frog} + \text{snail} + \text{octopus} + \text{snail} = 35$$

$$\text{octopus} + \text{snail} = 14$$

$$\text{snail} = \text{octopus} = \text{frog} =$$

$$\text{cat} + \text{butterfly} + \text{butterfly} + \text{cat} = 18$$

$$\text{frog} + \text{butterfly} = 4$$

$$\text{frog} + \text{cat} + \text{butterfly} = 12$$

$$\text{butterfly} = \text{frog} = \text{cat} =$$

$$\text{octopus} + \text{tree} + \text{octopus} + \text{owl} + \text{octopus} = 17$$

$$\text{tree} + \text{tree} + \text{owl} = 17$$

$$\text{owl} + \text{octopus} = 7$$

$$\text{octopus} = \text{owl} = \text{tree} =$$

$$\text{owl} + \text{owl} + \text{fish} + \text{snail} = 27$$

$$\text{fish} + \text{fish} + \text{owl} = 13$$

$$\text{owl} + \text{snail} + \text{snail} = 23$$

$$\text{snail} = \text{owl} = \text{fish} =$$

$$\text{owl} + \text{rabbit} = 15$$

$$\text{owl} + \text{butterfly} + \text{rabbit} = 16$$

$$\text{butterfly} + \text{rabbit} + \text{butterfly} + \text{butterfly} + \text{butterfly} = 13$$

$$\text{rabbit} = \text{owl} = \text{butterfly} =$$

$$\text{rabbit} + \text{fish} + \text{mushroom} + \text{fish} + \text{mushroom} = 19$$

$$\text{rabbit} + \text{mushroom} = 11$$

$$\text{fish} + \text{mushroom} = 6$$

$$\text{mushroom} = \text{fish} = \text{rabbit} =$$

# Mathemals Sheet 153

$$\text{Owl} + \text{Rabbit} + \text{Owl} + \text{Owl} + \text{Owl} = 31$$

$$\text{Rabbit} + \text{Owl} = 13$$

$$\text{Rabbit} + \text{Squirrel} + \text{Owl} = 17$$

$$\text{Owl} = \text{Rabbit} = \text{Squirrel} =$$

$$\text{Frog} + \text{Fish} + \text{Fish} = 7$$

$$\text{Fish} + \text{Fish} + \text{Fish} + \text{Frog} = 9$$

$$\text{Frog} + \text{Snail} + \text{Fish} = 14$$

$$\text{Fish} = \text{Frog} = \text{Snail} =$$

$$\text{Butterfly} + \text{Tree} + \text{Frog} + \text{Frog} = 9$$

$$\text{Tree} + \text{Butterfly} + \text{Butterfly} = 5$$

$$\text{Tree} + \text{Frog} + \text{Tree} = 5$$

$$\text{Butterfly} = \text{Tree} = \text{Frog} =$$

$$\text{Fish} + \text{Snail} = 11$$

$$\text{Fish} + \text{Snail} + \text{Fish} + \text{Fish} + \text{Butterfly} = 16$$

$$\text{Fish} + \text{Snail} + \text{Snail} = 20$$

$$\text{Snail} = \text{Fish} = \text{Butterfly} =$$

$$\text{Octopus} + \text{Rabbit} + \text{Rabbit} = 19$$

$$\text{Cat} + \text{Rabbit} + \text{Cat} + \text{Cat} = 31$$

$$\text{Octopus} + \text{Cat} + \text{Rabbit} = 20$$

$$\text{Rabbit} = \text{Octopus} = \text{Cat} =$$

$$\text{Snail} + \text{Frog} + \text{Snail} + \text{Snail} = 32$$

$$\text{Rabbit} + \text{Frog} = 13$$

$$\text{Rabbit} + \text{Frog} + \text{Frog} + \text{Snail} = 27$$

$$\text{Frog} = \text{Rabbit} = \text{Snail} =$$

$$\text{Cat} + \text{Fish} = 11$$

$$\text{Octopus} + \text{Fish} + \text{Octopus} + \text{Cat} + \text{Octopus} = 26$$

$$\text{Cat} + \text{Fish} + \text{Fish} = 20$$

$$\text{Fish} = \text{Cat} = \text{Octopus} =$$

$$\text{Snail} + \text{Snail} + \text{Snail} + \text{Rabbit} = 34$$

$$\text{Fish} + \text{Snail} + \text{Snail} = 20$$

$$\text{Fish} + \text{Rabbit} + \text{Snail} = 18$$

$$\text{Snail} = \text{Fish} = \text{Rabbit} =$$

# Mathemals Sheet 154

$$\text{butterfly} + \text{butterfly} + \text{butterfly} + \text{mushroom} = 30$$

$$\text{butterfly} + \text{fish} + \text{mushroom} = 18$$

$$\text{butterfly} + \text{mushroom} + \text{mushroom} = 25$$

$$\text{mushroom} = \text{butterfly} = \text{fish} =$$

$$\text{butterfly} + \text{fish} + \text{butterfly} + \text{cat} + \text{butterfly} = 16$$

$$\text{cat} + \text{fish} = 13$$

$$\text{fish} + \text{butterfly} + \text{butterfly} = 10$$

$$\text{fish} = \text{cat} = \text{butterfly} =$$

$$\text{rabbit} + \text{owl} + \text{rabbit} + \text{frog} + \text{rabbit} = 28$$

$$\text{frog} + \text{owl} = 7$$

$$\text{rabbit} + \text{owl} + \text{owl} = 15$$

$$\text{owl} = \text{frog} = \text{rabbit} =$$

$$\text{fish} + \text{snail} + \text{snail} = 8$$

$$\text{frog} + \text{frog} + \text{fish} + \text{snail} = 15$$

$$\text{frog} + \text{snail} + \text{snail} = 11$$

$$\text{snail} = \text{frog} = \text{fish} =$$

$$\text{frog} + \text{snail} = 12$$

$$\text{mushroom} + \text{snail} + \text{mushroom} + \text{mushroom} = 21$$

$$\text{snail} + \text{frog} + \text{mushroom} + \text{mushroom} = 20$$

$$\text{snail} = \text{frog} = \text{mushroom} =$$

$$\text{rabbit} + \text{tree} = 10$$

$$\text{rabbit} + \text{tree} + \text{tree} + \text{snail} = 27$$

$$\text{tree} + \text{tree} + \text{tree} + \text{snail} = 33$$

$$\text{tree} = \text{rabbit} = \text{snail} =$$

$$\text{octopus} + \text{octopus} + \text{octopus} + \text{fish} = 26$$

$$\text{rabbit} + \text{octopus} = 14$$

$$\text{rabbit} + \text{rabbit} + \text{fish} + \text{octopus} = 22$$

$$\text{octopus} = \text{rabbit} = \text{fish} =$$

$$\text{octopus} + \text{butterfly} = 6$$

$$\text{cat} + \text{butterfly} + \text{butterfly} = 10$$

$$\text{octopus} + \text{butterfly} + \text{octopus} + \text{octopus} + \text{cat} = 24$$

$$\text{butterfly} = \text{octopus} = \text{cat} =$$

# Mathemals Sheet 155

$$\begin{aligned} & \text{mushroom} + \text{tree} = 12 \\ \text{snail} + \text{snail} + \text{mushroom} + \text{snail} &= 31 \\ \text{mushroom} + \text{tree} + \text{tree} + \text{snail} &= 29 \\ \text{tree} = & \quad \text{mushroom} = \quad \text{snail} = \end{aligned}$$

$$\begin{aligned} & \text{owl} + \text{tree} + \text{tree} = 8 \\ \text{owl} + \text{owl} + \text{tree} &= 13 \\ \text{tree} + \text{owl} + \text{octopus} + \text{octopus} &= 17 \\ \text{tree} = & \quad \text{owl} = \quad \text{octopus} = \end{aligned}$$

$$\begin{aligned} & \text{rabbit} + \text{rabbit} + \text{owl} + \text{rabbit} = 26 \\ & \text{owl} + \text{frog} + \text{frog} = 13 \\ & \text{owl} + \text{rabbit} + \text{frog} = 16 \\ \text{frog} = & \quad \text{owl} = \quad \text{rabbit} = \end{aligned}$$

$$\begin{aligned} & \text{frog} + \text{rabbit} + \text{rabbit} = 12 \\ & \text{frog} + \text{cat} + \text{rabbit} = 17 \\ \text{cat} + \text{frog} + \text{frog} + \text{frog} &= 26 \\ \text{rabbit} = & \quad \text{frog} = \quad \text{cat} = \end{aligned}$$

$$\begin{aligned} & \text{butterfly} + \text{fish} = 3 \\ \text{fish} + \text{fish} + \text{cat} + \text{fish} + \text{fish} &= 16 \\ & \text{butterfly} + \text{cat} + \text{fish} = 11 \\ \text{fish} = & \quad \text{butterfly} = \quad \text{cat} = \end{aligned}$$

$$\begin{aligned} & \text{fish} + \text{frog} + \text{frog} = 4 \\ & \text{tree} + \text{frog} + \text{frog} = 6 \\ \text{tree} + \text{frog} + \text{frog} + \text{fish} &= 8 \\ \text{frog} = & \quad \text{tree} = \quad \text{fish} = \end{aligned}$$

$$\begin{aligned} & \text{frog} + \text{frog} + \text{butterfly} = 19 \\ \text{frog} + \text{butterfly} + \text{butterfly} + \text{cat} &= 28 \\ & \text{frog} + \text{butterfly} + \text{butterfly} = 20 \\ \text{butterfly} = & \quad \text{frog} = \quad \text{cat} = \end{aligned}$$

$$\begin{aligned} & \text{cat} + \text{butterfly} + \text{cat} + \text{rabbit} + \text{cat} = 32 \\ & \text{rabbit} + \text{cat} = 15 \\ & \text{rabbit} + \text{cat} + \text{cat} = 23 \\ \text{cat} = & \quad \text{rabbit} = \quad \text{butterfly} = \end{aligned}$$

# Mathemals Sheet 156

$$\begin{array}{rcl}
 & & \text{tree} + \text{butterfly} = 5 \\
 \text{butterfly} + \text{tree} + \text{cat} + \text{cat} + \text{tree} & = & 25 \\
 & & \text{cat} + \text{butterfly} = 9 \\
 \text{butterfly} = & \text{tree} = & \text{cat} =
 \end{array}$$

$$\begin{array}{rcl}
 & & \text{tree} + \text{frog} + \text{tree} = 5 \\
 & & \text{tree} + \text{cat} + \text{cat} = 19 \\
 \text{tree} + \text{cat} + \text{cat} + \text{frog} & = & 22 \\
 \text{cat} = & \text{tree} = & \text{frog} =
 \end{array}$$

$$\begin{array}{rcl}
 & & \text{butterfly} + \text{mushroom} = 5 \\
 \text{mushroom} + \text{butterfly} + \text{mushroom} + \text{mushroom} + \text{mushroom} & = & 8 \\
 \text{butterfly} + \text{butterfly} + \text{cat} + \text{mushroom} & = & 17 \\
 \text{mushroom} = & \text{butterfly} = & \text{cat} =
 \end{array}$$

$$\begin{array}{rcl}
 \text{fish} + \text{fish} + \text{owl} + \text{frog} & = & 13 \\
 \text{owl} + \text{fish} + \text{fish} + \text{fish} & = & 12 \\
 \text{fish} + \text{frog} + \text{frog} & = & 8 \\
 \text{frog} = & \text{fish} = & \text{owl} =
 \end{array}$$

$$\begin{array}{rcl}
 \text{cat} + \text{owl} + \text{owl} + \text{owl} & = & 17 \\
 \text{owl} + \text{cat} + \text{fish} & = & 16 \\
 \text{fish} + \text{fish} + \text{fish} + \text{owl} & = & 18 \\
 \text{fish} = & \text{owl} = & \text{cat} =
 \end{array}$$

$$\begin{array}{rcl}
 & & \text{fish} + \text{frog} + \text{snail} = 16 \\
 \text{fish} + \text{fish} + \text{fish} + \text{snail} + \text{fish} & = & 40 \\
 \text{fish} + \text{snail} + \text{snail} & = & 17 \\
 \text{snail} = & \text{fish} = & \text{frog} =
 \end{array}$$

$$\begin{array}{rcl}
 & & \text{frog} + \text{snail} + \text{snail} = 21 \\
 \text{snail} + \text{frog} + \text{butterfly} + \text{butterfly} & = & 14 \\
 \text{snail} + \text{snail} + \text{snail} + \text{butterfly} & = & 28 \\
 \text{snail} = & \text{frog} = & \text{butterfly} =
 \end{array}$$

$$\begin{array}{rcl}
 & & \text{tree} + \text{owl} = 8 \\
 \text{owl} + \text{owl} + \text{owl} + \text{tree} & = & 22 \\
 \text{octopus} + \text{owl} + \text{octopus} + \text{tree} + \text{octopus} & = & 23 \\
 \text{owl} = & \text{tree} = & \text{octopus} =
 \end{array}$$

# Mathemals Sheet 157

$$\text{Owl} + \text{Owl} + \text{Frog} + \text{Rabbit} = 22$$

$$\text{Owl} + \text{Rabbit} + \text{Rabbit} = 20$$

$$\text{Rabbit} + \text{Rabbit} + \text{Rabbit} + \text{Frog} = 24$$

$$\text{Rabbit} = \quad \text{Owl} = \quad \text{Frog} =$$

$$\text{Butterfly} + \text{Frog} = 4$$

$$\text{Frog} + \text{Frog} + \text{Frog} + \text{Butterfly} = 10$$

$$\text{Butterfly} + \text{Frog} + \text{Butterfly} + \text{Butterfly} + \text{Octopus} = 11$$

$$\text{Frog} = \quad \text{Butterfly} = \quad \text{Octopus} =$$

$$\text{Frog} + \text{Snail} = 12$$

$$\text{Frog} + \text{Frog} + \text{Octopus} + \text{Snail} = 26$$

$$\text{Snail} + \text{Snail} + \text{Octopus} + \text{Snail} + \text{Snail} = 17$$

$$\text{Snail} = \quad \text{Frog} = \quad \text{Octopus} =$$

$$\text{Butterfly} + \text{Octopus} + \text{Octopus} + \text{Mushroom} = 14$$

$$\text{Mushroom} + \text{Butterfly} + \text{Butterfly} + \text{Butterfly} = 16$$

$$\text{Butterfly} + \text{Octopus} + \text{Octopus} = 13$$

$$\text{Octopus} = \quad \text{Butterfly} = \quad \text{Mushroom} =$$

$$\text{Octopus} + \text{Fish} + \text{Fish} = 9$$

$$\text{Butterfly} + \text{Butterfly} + \text{Octopus} + \text{Butterfly} = 8$$

$$\text{Fish} + \text{Octopus} + \text{Butterfly} + \text{Butterfly} = 9$$

$$\text{Fish} = \quad \text{Octopus} = \quad \text{Butterfly} =$$

$$\text{Snail} + \text{Rabbit} = 15$$

$$\text{Butterfly} + \text{Snail} + \text{Rabbit} + \text{Snail} + \text{Rabbit} = 31$$

$$\text{Snail} + \text{Rabbit} + \text{Rabbit} = 23$$

$$\text{Rabbit} = \quad \text{Snail} = \quad \text{Butterfly} =$$

$$\text{Butterfly} + \text{Frog} = 4$$

$$\text{Frog} + \text{Butterfly} + \text{Cat} + \text{Cat} = 20$$

$$\text{Frog} + \text{Frog} + \text{Cat} + \text{Frog} + \text{Frog} = 20$$

$$\text{Frog} = \quad \text{Butterfly} = \quad \text{Cat} =$$

$$\text{Octopus} + \text{Octopus} + \text{Octopus} + \text{Fish} = 21$$

$$\text{Fish} + \text{Octopus} + \text{Mushroom} + \text{Mushroom} = 19$$

$$\text{Octopus} + \text{Fish} + \text{Fish} = 17$$

$$\text{Fish} = \quad \text{Octopus} = \quad \text{Mushroom} =$$

# Mathemals Sheet 158

$$\begin{aligned}
 & \text{owl} + \text{octopus} + \text{octopus} = 14 \\
 & \text{frog} + \text{octopus} = 7 \\
 & \text{frog} + \text{octopus} + \text{owl} + \text{owl} + \text{octopus} = 23 \\
 & \text{octopus} = \text{frog} = \text{owl} =
 \end{aligned}$$

$$\begin{aligned}
 & \text{octopus} + \text{octopus} + \text{octopus} + \text{frog} = 17 \\
 & \text{octopus} + \text{octopus} + \text{octopus} + \text{butterfly} = 10 \\
 & \text{frog} + \text{butterfly} + \text{octopus} = 12 \\
 & \text{octopus} = \text{frog} = \text{butterfly} =
 \end{aligned}$$

$$\begin{aligned}
 & \text{tree} + \text{octopus} + \text{owl} = 15 \\
 & \text{tree} + \text{owl} + \text{owl} = 16 \\
 & \text{octopus} + \text{tree} + \text{octopus} + \text{octopus} + \text{octopus} = 24 \\
 & \text{owl} = \text{tree} = \text{octopus} =
 \end{aligned}$$

$$\begin{aligned}
 & \text{fish} + \text{mushroom} + \text{mushroom} = 10 \\
 & \text{fish} + \text{mushroom} + \text{cat} + \text{cat} + \text{mushroom} = 26 \\
 & \text{fish} + \text{mushroom} = 6 \\
 & \text{mushroom} = \text{fish} = \text{cat} =
 \end{aligned}$$

$$\begin{aligned}
 & \text{owl} + \text{owl} + \text{tree} + \text{cat} = 31 \\
 & \text{tree} + \text{tree} + \text{owl} + \text{tree} = 26 \\
 & \text{owl} + \text{cat} + \text{cat} = 26 \\
 & \text{cat} = \text{owl} = \text{tree} =
 \end{aligned}$$

$$\begin{aligned}
 & \text{snail} + \text{frog} + \text{snail} + \text{cat} + \text{snail} = 33 \\
 & \text{snail} + \text{snail} + \text{snail} + \text{frog} = 24 \\
 & \text{cat} + \text{snail} = 16 \\
 & \text{snail} = \text{cat} = \text{frog} =
 \end{aligned}$$

$$\begin{aligned}
 & \text{rabbit} + \text{octopus} + \text{rabbit} = 19 \\
 & \text{rabbit} + \text{snail} + \text{snail} = 23 \\
 & \text{snail} + \text{octopus} + \text{snail} + \text{rabbit} + \text{snail} = 36 \\
 & \text{snail} = \text{rabbit} = \text{octopus} =
 \end{aligned}$$

$$\begin{aligned}
 & \text{cat} + \text{tree} + \text{tree} = 13 \\
 & \text{cat} + \text{cat} + \text{tree} = 17 \\
 & \text{tree} + \text{snail} + \text{tree} + \text{cat} + \text{tree} = 25 \\
 & \text{tree} = \text{cat} = \text{snail} =
 \end{aligned}$$

# Mathemals Sheet 159

$$\begin{array}{rcl}
 & \text{fish} & + \text{snail} + \text{snail} = 14 \\
 \text{snail} + \text{fish} + \text{snail} + \text{snail} + \text{snail} & = & 22 \\
 & \text{fish} & + \text{butterfly} + \text{snail} = 11 \\
 \text{snail} = & \text{fish} = & \text{butterfly} =
 \end{array}$$

$$\begin{array}{rcl}
 & & \text{frog} + \text{tree} = 10 \\
 \text{frog} + \text{tree} + \text{frog} + \text{frog} + \text{butterfly} & = & 17 \\
 \text{tree} + \text{tree} + \text{tree} + \text{butterfly} & = & 22 \\
 \text{tree} = & \text{frog} = & \text{butterfly} =
 \end{array}$$

$$\begin{array}{rcl}
 \text{octopus} + \text{snail} + \text{snail} + \text{cat} & = & 25 \\
 & \text{octopus} & + \text{snail} = 12 \\
 \text{snail} + \text{octopus} + \text{snail} + \text{snail} + \text{snail} & = & 27 \\
 \text{snail} = & \text{octopus} = & \text{cat} =
 \end{array}$$

$$\begin{array}{rcl}
 \text{frog} + \text{tree} + \text{tree} + \text{owl} & = & 19 \\
 & \text{frog} & + \text{tree} + \text{tree} = 13 \\
 \text{owl} + \text{tree} + \text{owl} + \text{owl} & = & 23 \\
 \text{tree} = & \text{frog} = & \text{owl} =
 \end{array}$$

$$\begin{array}{rcl}
 \text{butterfly} + \text{cat} + \text{butterfly} + \text{butterfly} + \text{butterfly} & = & 12 \\
 & \text{cat} & + \text{butterfly} = 9 \\
 \text{butterfly} + \text{cat} + \text{owl} + \text{owl} & = & 21 \\
 \text{butterfly} = & \text{cat} = & \text{owl} =
 \end{array}$$

$$\begin{array}{rcl}
 \text{owl} + \text{cat} + \text{owl} + \text{owl} & = & 26 \\
 \text{cat} + \text{frog} + \text{owl} + \text{owl} & = & 23 \\
 & \text{frog} & + \text{cat} + \text{cat} = 19 \\
 \text{cat} = & \text{frog} = & \text{owl} =
 \end{array}$$

$$\begin{array}{rcl}
 \text{snail} + \text{fish} + \text{fish} & = & 13 \\
 \text{snail} + \text{fish} + \text{fish} + \text{octopus} & = & 18 \\
 \text{fish} + \text{fish} + \text{fish} + \text{snail} & = & 15 \\
 \text{fish} = & \text{snail} = & \text{octopus} =
 \end{array}$$

$$\begin{array}{rcl}
 \text{mushroom} + \text{frog} + \text{octopus} & = & 15 \\
 \text{octopus} + \text{octopus} + \text{octopus} + \text{mushroom} & = & 20 \\
 \text{mushroom} + \text{mushroom} + \text{mushroom} + \text{octopus} & = & 28 \\
 \text{octopus} = & \text{mushroom} = & \text{frog} =
 \end{array}$$

# Mathemals Sheet 160

$$\text{snail} + \text{rabbit} + \text{rabbit} + \text{snail} = 20$$

$$\text{butterfly} + \text{rabbit} + \text{rabbit} = 7$$

$$\text{butterfly} + \text{snail} + \text{rabbit} = 15$$

$$\text{rabbit} = \text{butterfly} = \text{snail} =$$

$$\text{frog} + \text{owl} + \text{frog} + \text{octopus} + \text{frog} = 15$$

$$\text{octopus} + \text{octopus} + \text{owl} = 8$$

$$\text{octopus} + \text{owl} + \text{owl} = 10$$

$$\text{owl} = \text{octopus} = \text{frog} =$$

$$\text{owl} + \text{butterfly} = 7$$

$$\text{owl} + \text{butterfly} + \text{butterfly} + \text{octopus} = 13$$

$$\text{octopus} + \text{butterfly} + \text{octopus} + \text{octopus} + \text{octopus} = 21$$

$$\text{butterfly} = \text{owl} = \text{octopus} =$$

$$\text{frog} + \text{fish} + \text{snail} = 19$$

$$\text{frog} + \text{snail} + \text{snail} = 26$$

$$\text{frog} + \text{fish} + \text{fish} + \text{frog} = 20$$

$$\text{snail} = \text{frog} = \text{fish} =$$

$$\text{snail} + \text{fish} + \text{fish} + \text{rabbit} = 20$$

$$\text{fish} + \text{fish} + \text{fish} + \text{rabbit} = 13$$

$$\text{snail} + \text{fish} + \text{fish} = 13$$

$$\text{fish} = \text{snail} = \text{rabbit} =$$

$$\text{tree} + \text{frog} + \text{frog} = 20$$

$$\text{tree} + \text{octopus} + \text{frog} = 19$$

$$\text{tree} + \text{tree} + \text{octopus} + \text{tree} + \text{tree} = 37$$

$$\text{frog} = \text{tree} = \text{octopus} =$$

$$\text{mushroom} + \text{butterfly} + \text{butterfly} = 6$$

$$\text{butterfly} + \text{mushroom} + \text{octopus} + \text{octopus} = 15$$

$$\text{butterfly} + \text{butterfly} + \text{butterfly} + \text{mushroom} = 7$$

$$\text{butterfly} = \text{mushroom} = \text{octopus} =$$

$$\text{frog} + \text{owl} = 9$$

$$\text{owl} + \text{octopus} + \text{owl} + \text{frog} + \text{owl} = 26$$

$$\text{octopus} + \text{octopus} + \text{frog} + \text{octopus} = 18$$

$$\text{owl} = \text{frog} = \text{octopus} =$$

# Mathematics Strategy

A mathematics game gives you 3 equations -- each an expression on the left made of animals and the total value of those animals added up on the right. You have to figure out the value each animal.

Each animal's value is the same across all three equations in that single game, and also each animal has a *different* value. There is exactly one correct answer for each animal. Of course the animals' values can change from one game to the next.

## Tactics

Here are some tactics you can use.

- If all the animals in an equation are the same type, you can use **division** to discover that animal's value.
- If you know one animal's value, you can **substitute** it in any equation. You can even do this with multiple animals. For example, if you know 🐡 plus 🐡 is 17, you can replace a 🐡 and a 🐡, in any equation, with 17 -- even if you don't know the individual values of 🐡 and 🐡.
- It doesn't matter which order you add two things, so you're free to **reorder** animals whenever you want.
- You can always **subtract the same thing from both sides** of an equation. So if you have an 🐡 worth 8 on the left and the number 17 on the right, you can remove the 🐡 from the left and subtract 8 from the right, leaving 9.
- You can **join equations**, adjusting for a known difference in value. For example, if 🐡 plus 🐡 is 4 and 🐡 plus 🐡 is 6 then  $\text{🐡} + \text{🐡} + 2 = \text{🐡} + \text{🐡}$ . Subtracting 🐡 from both sides, you can see that  $\text{🐡} = \text{🐡} + 2$ .
- Some equations can be narrowed down with an **educated guess**. If three 🐡s plus a 🐡 add to 7, then the 🐡s have to be either 1 or 2 and the 🐡 has to be 4 or 1. Anything else would be too large.

# Example

Given this mathemals game:

$$\begin{aligned}\text{🐱} + \text{🐱} + \text{🐹} + \text{🦋} &= 21 \\ \text{🦋} + \text{🦋} + \text{🦋} + \text{🐱} &= 11 \\ \text{🐱} + \text{🦋} + \text{🐹} &= 13\end{aligned}$$

First, notice that we can **reorder** the animals in the bottom equation so they match the  $\text{🐱} + \text{🐹} + \text{🦋}$  in the top equation. Then we can **subtract** the bottom equation from the top.

$$\begin{array}{rcll}\text{🐱} + \text{🐱} + \text{🐹} + \text{🦋} & = & 21 \\ \text{🐱} + \text{🐹} + \text{🦋} & = & 13 \\ \hline & & \text{🐱} & = 8\end{array}$$

Now we can **substitute**  $\text{🐱} = 8$  into the middle equation to get:

$$\text{🦋} + \text{🦋} + \text{🦋} + 8 = 11$$

**Subtract** 8 from both sides to get:

$$\text{🦋} + \text{🦋} + \text{🦋} = 3$$

And then **divide** both sides by 3 to get:

$$\text{🦋} = 1$$

Finally, we can **substitute** the two known values into any equation containing  $\text{🐹}$  and then subtract the same amount from both sides to get an equation that contains only  $\text{🐹}$ s:

$$\begin{aligned}\text{🐱} + \text{🦋} + \text{🐹} &= 13 \\ 8 + 1 + \text{🐹} &= 13 \\ \text{🐹} &= 4\end{aligned}$$

Voila! We now have:

$$\text{🐱} = 8, \text{🦋} = 1, \text{🐹} = 4$$