

Rebecca + Beth

$B$  = boys in class

$G$  = girls in class

$C$  = total number in class

$$\times c-1 \left( \frac{10}{c} \times \frac{9}{c-1} = 0.15 \right.$$

$$\left. \frac{10}{c} \times \frac{9}{c-1} \times \frac{c-1}{1} = 0.15c - 0.15 \right) \times c-1$$

$$\frac{10}{c} \times 9 = 0.15c - 0.15$$

$$\times c \left( \frac{90}{c} = 0.15c - 0.15 \right. \left. \right) \times c$$

$$90 = 0.15c^2 - 0.15c$$

$$0.15c^2 - 0.15c - 90 = 0$$

Quadratic formula  $C = \frac{0.15 \pm \sqrt{54.0225}}{0.3} = 25 \text{ or } -24$

There cannot be a negative number of people in the class, so we will take the value of  $C$  as 25

$$B = C - G$$

$$B = 25 - 10$$

$$B = 15$$

Oliver Howard

$x$  is equal to the number of boys.  
The probability of picking 2 girls is:

$$\frac{10}{x+10} \times \frac{9}{x+9} = 0.15$$

Simplified:

$$\frac{90}{x^2 + 19x + 90} = 0.15$$

multiplied by:  $x^2 + 19x + 90$

$$90 = 0.15x^2 + 2.85x + 13.5$$

take 90:

$$0 = 0.15x^2 + 2.85x - 76.5$$

Use Quadratic formula of  $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$\frac{-2.85 \pm \sqrt{2.85^2 - 4 \times 0.15 \times -76.5}}{2 \times 0.15} = 15 \text{ or } -34$$

There cannot be a negative number of boys so:

$$x = 15$$

There are 10 ~~boys~~ girls,  $b$  boys and  $x$  people in total.

So:  $x = 10 + b$

0.15 is the probability of picking a girl twice:

$$\frac{10}{x} \times \frac{9}{x-1} = 0.15$$

Since one has been picked

Solve this equation:

$$\frac{90}{x^2 - x} = 0.15$$
$$= \frac{3}{20}$$

$$\frac{x^2 - x}{90} = \frac{20}{3}$$

$$x^2 - x = \frac{20}{3} \times 90$$
$$= 600$$

$$x = \del{600} 25$$

So the total children = 25, substitute this into the first equation.

$$25 = 10 + b$$

$$15 = b$$

15 boys

Peter &

Tom &

Fiona

4. Using the Formula:

$$\frac{-(-1) \pm \sqrt{(-1)^2 - 4 \times (-600) \times 1}}{2 \times 1}$$

$$\frac{1 \pm \sqrt{1 + 2400}}{2} = 25$$

Positive solution ✓

Therefore  $x = 25$ . As the original number of girls was 10, we can find the number of boys by doing

$$25 - 10 = 15$$

There are 15 boys in the class!

Comberton Village College

Thomas Dimaline

Wilke Grosche

## The Unsolved Problem

Sanjeeta Abram 11 I

$$\frac{10}{x} = \frac{\text{No. of girls in class}}{\text{Total no. of pupils}}$$

$$0.15 = \frac{10}{x} \times \frac{9}{x-1} = \frac{90}{x^2-x}$$

$$\frac{90}{x^2-x} = 0.15$$

$$90 = 0.15(x^2-x)$$

$$\frac{90}{0.15} = x^2-x$$

$$600 = x^2-x$$

$$x^2-x-600 = 0$$

$$x = \frac{1 \pm \sqrt{1+4(600)}}{2}$$

$$x = \frac{1 \pm \sqrt{2401}}{2}$$

$$x = \frac{1+49}{2} \quad (\text{Chosen positive because there can't be a negative no. of pupils in the classroom.})$$

$$x = \frac{50}{2}$$

$$x = 25 = \text{total no. of pupils}$$

$$25 - 10 = 15 = \text{no. of boys}$$