

**YOU & MATHS** Solve for  $y$ :  $\frac{y}{9} + 4 < \frac{y-5}{5} + 1$ .

A  $y < 45$

B  $y > 45$

C  $y < -1$

D  $y > -1$

E  $y < 9$

(CAN Canadian Open Mathematics Challenge, 1996)

Let's simplify the right-hand side of the inequality:

$$\frac{y-5}{5} + 1 = \frac{y}{5} - 1 + 1 = \frac{y}{5}.$$

So the inequality becomes:

$$\frac{y}{9} + 4 < \frac{y}{5}.$$

We can now move the addends containing the variable to the same side:

$$\frac{y}{5} - \frac{y}{9} > 4 \rightarrow \frac{9y-5y}{45} \rightarrow \frac{4y}{45} > 4 \rightarrow \frac{y}{45} > 1 \rightarrow y > 45.$$

Our final answer is therefore B.