1 Turn each sentence into an equation. **Try real numbers first.**

(a) There are seven times as many pupils, P, as teachers, T (1)

(b) There are four times as many chairs, C, as tables, T (1)

(c) There are half as many prefects, R, as classes, L (1)

(d) For every three cows, C, there are eight goats, G (1)

(4 marks)

2 Three jigsaw boxes hold n, $3n$ and $2n + 40$ pieces.

(a) If $n = 10$, work out how many pieces are in each box (2)

(b) If $n = 50$, work out how many pieces are in each box (2)

(c) Which box always holds the fewest, whatever n is? Explain how you know. (2)

(d) Which box holds the most? Explain your answer carefully. (2)

(7 marks)

3 Four pupils' heights are $x - 5$, x, $2x - 60$ and $x + 10$ centimetres.

(a) If $x = 150$, work out all four heights (2)

(b) Name one pupil who is definitely shorter than another, whatever x is, and say how you know (2)

(c) The third height behaves differently from the others. Work it out when $x = 30$ and say what is strange (2)

(6 marks)

4 Describe a situation that each expression could be about.

(a) $100 - 5n$ (2)

(b) $\frac{x}{4} + 3$ (2)

(6 marks)

5 A shop sells pens at p shillings each and notebooks at q shillings each.

(a) Write an expression for the cost of 4 pens and 3 notebooks (1)

(b) Write an expression for the cost of 10 pens and 10 notebooks, simplified as far as possible (1)

(c) Explain why your answer to (b) cannot be simplified to a single term (2)

(d) If a pen costs 700 and a notebook $1{,}200$, find the cost in (a) (1)

(6 marks)

6 **Open question.** Write down **three different situations** that could all be described by the same expression, $5n + 20$. Say what n counts in each one.

(6 marks)