1 Simplify each expression. These involve fractions.

(a) $\frac{2}{3}y \times \frac{3}{4}$ (1)

(b) $\frac{5}{12}n \times \frac{4}{5}$ (1)

(c) $\frac{1}{2}x + \frac{1}{4}x$ (1)

(d) $\frac{3}{4}a - \frac{1}{4}a$ (1)

(4 marks)

2 A rectangle is $4p$ cm long and $2p$ cm wide.

(a) Write a simplified expression for its perimeter (1)

(b) Find the perimeter when $p = 8$ (1)

(c) A second rectangle is $6p$ long and p wide. Write a simplified expression for its perimeter (1)

(d) Which rectangle has the greater perimeter, and does the answer depend on p? (2)

(6 marks)

3 Stephanie is y years old and Kalama is twice as old as Stephanie.

(a) Write an expression for Kalama's age now (1)

(b) Write an expression for each of their ages in two years' time (1)

(c) If $y = 10$, work out both of their ages in two years' time (1)

(d) In two years' time, will Kalama still be exactly twice as old as Stephanie? Use your answer to (c) to explain. (2)

(7 marks)

4 Open question. Write **two different expressions** that are each equivalent to $4x - 8$.

(4 marks)

5 Two pupils simplified the same expression and disagreed. The expression was $6m + 4 - 2m - 9$. Dembe wrote $4m - 5$ and Esther wrote $4m + 13$.

(a) Work out the correct answer (1)

(b) Write down the mistake Esther made (2)

(c) Find a value of m that would have shown Esther her answer was wrong, and write down what both expressions come to (2)

(5 marks)

6 Extension. Here are three expressions.

$3x + 12$ $\quad x + x + x + 12$ $\quad 3x + 3 \times 4$

(a) Show that all three are equivalent (2)

(b) Write a fourth expression, as different-looking as you can make it, that is also equivalent to these three (2)

(c) A pupil says: *there must be a limited number of expressions equivalent to* $3x + 12$. Find a way to show there are more than anyone could ever write down. (2)

(7 marks)