1 A pendulum was timed. It made 9 swings in 15 seconds.

(a) How many swings does it make in one second? (1)

(b) Write a formula for the number of swings n in t seconds (1)

(c) How many swings in 55 seconds? (1)

(d) Test your formula against the original measurement of 15 seconds (1)

(4 marks)

2 A car uses 7 litres of fuel every 100 kilometres.

(a) How many litres does it use in one kilometre? (1)

(b) Write a formula for the fuel F used in k kilometres (1)

(c) How much fuel for a 250 km journey? (1)

(d) The tank holds 42 litres. How far can the car travel on a full tank? (1)

(5 marks)

3 Three friends share the cost of a taxi equally. The taxi charges $2{,}000$ shillings to start and 600 shillings a kilometre.

(a) Write a formula for the total fare C for d kilometres (2)

(b) Find the total fare for a 10 km journey (1)

(c) How much does each friend pay for that journey? (1)

(d) Write a formula for the amount A that each friend pays for a journey of d kilometres (2)

(6 marks)

4 A shopkeeper claims the cost C of n sodas is given by $C = 2000n - 500$. The real prices are in the table.

n	1	2	3
cost	2000	4000	6000

(a) Work out the shopkeeper's formula for $n = 1$ (1)

(b) Does the shopkeeper's formula fit the table? Use your answer to (a). (2)

(c) Write the correct formula (1)

(d) Test your formula on all three rows of the table (2)

(5 marks)

5 A rectangle has a length that is always 3 cm more than its width.

(a) If the width is 5 cm, what is the length? (1)

(b) Write a formula for the length l when the width is w (1)

(c) Write a formula for the perimeter P in terms of w alone (2)

(d) Find the perimeter when the width is 7 cm (1)

(6 marks)

6 Open question. Think of something that is charged at a fixed amount plus a rate – anything at all.

(a) Describe the situation in one sentence, and say what your letters stand for (2)

(b) Write the formula (2)

(c) Work out two cases using your formula (2)

(6 marks)