1 Nicole and Grace share a birth date, but Grace is 5 years older.

(a) If Nicole is 15 years old, how old is Grace? (1)

(b) If Nicole is p years old, how old is Grace? (1)

(c) If Grace is q years old, how old is Nicole? (1)

(3 marks)

2 A boy is y years old.

(a) His sister is 4 years older than him (1)

(b) His brother is 2 years younger than him (1)

(c) His grandmother is 8 times as old as him (1)

(d) Write an expression for the total age of all four of them (1)

(4 marks)

3 A trader packs oranges into bags. Every bag holds exactly 5 oranges.

(a) Write an expression for the number of oranges in b bags (1)

(b) She has k oranges, and k is a multiple of 5. Write an expression for the number of bags she can pack (1)

(c) She has 403 oranges. How many full bags can she pack, and how many oranges are left over? (1)

(3 marks)

4 Jamie charges $24{,}000$ shillings for each hour of coaching.

(a) How much does he earn for 2 hours? (1)

(b) Write an expression for what he earns for p hours (1)

(c) He also charges a fixed $5{,}000$ shillings for transport. Write an expression for what he earns for p hours now (1)

(3 marks)

5 Two pupils were asked: *Sara had y oranges, gave away 3, and shared the rest equally among 4 friends. How many did each friend get?* Amina wrote $\dfrac{y-3}{4}$. Brian wrote $y - \dfrac{3}{4}$.

(a) Find a value of y for which these two expressions give different answers, and write down both answers (2)

(b) Which expression answers the question, and what does the other one describe? (2)

(4 marks)

6 A rectangle has sides x and 6. It is cut in half down the middle, parallel to the short side.

(a) Write an expression for the perimeter of the whole rectangle (1)

(b) Write an expression for the perimeter of one of the two halves (1)

(c) Kwame says cutting the rectangle in half must halve the perimeter. Work out both perimeters when $x = 8$, and say what is wrong with what he said (2)

(4 marks)

7 Odd one out. Look at these four expressions.

$3x$ $\quad x + x + x$ $\quad x^3$ $\quad 3 + x$

(a) Give a reason why $3x$ could be the odd one out (2)

(b) Give a reason why $x + x + x$ could be the odd one out (2)

(c) Give a reason why x^3 could be the odd one out (2)

(d) Give a reason why $3 + x$ could be the odd one out (2)

(e) Two of the four are the same expression written two ways. Which two? (1)

(9 marks)

8 Extension. At a restaurant, for every four people who order cheesecake, five people order chocolate cake. Let c be the number of cheesecakes ordered and s the number of chocolate cakes.

(a) If $c = 8$, what is s? (1)

(b) If $c = 20$, what is s? (1)

(c) Write an equation connecting c and s (2)

(4 marks)