1 Evaluate the following expressions when $x = \frac{3}{4}$.

(a) $4x + 3$ (1)

(b) $x - \frac{1}{2}$ (1)

(c) $7x - 3$ (1)

(d) $0.5 + 12x$ (1)

(4 marks)

2 Evaluate the following expressions when $x = \frac{2}{5}$.

(a) $x - \frac{1}{5}$ (1)

(b) $10x - 1$ (1)

(c) $\frac{15}{2}x + 3$ (1)

(d) $\frac{1}{3}x + \frac{1}{5}$ (1)

(4 marks)

3 Evaluate $\frac{3x}{4}$ when $x = \frac{3}{5}$, in two ways.

(a) By rewriting $\frac{3x}{4}$ as $\frac{3}{4}x$ first (2)

(b) By rewriting $\frac{3x}{4}$ as $3x \div 4$ first (2)

(4 marks)

4 Riya noticed that a swinging pendulum made 9 cycles every 15 seconds.

(a) She counted 21 cycles. How long was the pendulum swinging? (1)

(b) Write an expression for the number of cycles in t seconds (1)

(c) Emma used the same pendulum for 55 seconds. How many cycles did she count? (1)

(3 marks)

5 Ian was asked to evaluate $x^3 + 4$ when $x = 2$. He wrote down the answer 10.

(a) Work out the correct answer (1)

(b) Write down the calculation Ian did to get 10 (2)

(3 marks)

6 There are three jigsaw boxes. The first holds n pieces, the second holds $3n$, and the third holds $2n + 40$.

(a) If $n = 10$, put the three boxes in order, smallest first (1)

(b) If $n = 50$, put the three boxes in order, smallest first (1)

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

(d) Which of the other two is bigger depends on n. Find the value of n at which they are equal (2)

(6 marks)

7 Look at the two expressions $2x$ and x^2.

(a) Find a value of x for which they agree (1)

(b) Find a second, different value of x for which they agree (1)

(c) Find a value of x for which they disagree, and write down both answers (2)

(d) You have now found two numbers that agree and one that disagrees. How many agreements would it take to convince you that two expressions are the same for *every* number? Write down what you think. (2)

(6 marks)