

Question 1

Calculate each of these and give your answer in *its simplest form* (5 marks)

▶1. $3 \times \frac{2}{7} = \dots\dots\dots$

▶2. $9 \times \frac{7}{6} = \dots\dots\dots$

▶3. $4 \times \frac{7}{8} = \dots\dots\dots$

▶4. $7 \div \frac{4}{5} = \dots\dots\dots$

▶5. $13 \div \frac{26}{3} = \dots\dots\dots$

Question 2

Simplify these expressions by collecting *like terms* (5 marks)

▶1. $4y + 3y = \dots\dots\dots$

▶2. $-4t + 2t - 9t = \dots\dots\dots$

▶3. $4 - 3y - x + 2y - 4x = \dots\dots\dots$

▶4. $10x - 3x + 4x = \dots\dots\dots$

▶5. $2p - 4q - 5p + 6q = \dots\dots\dots$

Question 3

Calculate each of these and give your answer in *its simplest form* (2 marks)

▶1. $\frac{1}{a} + \frac{2}{a} + \frac{3}{a} = 1$. Find the value of a .

▶2. $\frac{1}{b} + \frac{2}{b} + \frac{3}{b} + \frac{4}{b} + \frac{5}{b} = 1$. Find the value of b .

Question 4

Simplify these expressions by multiplying out the brackets (5 marks)

▶1. $2(a + 4) = \dots\dots\dots$

▶2. $6(2x - y) = \dots\dots\dots$

▶3. $5(m - 2) = \dots\dots\dots$

▶4. $p(2q + 3r) = \dots\dots\dots$

▶5. $2r(3q + 4) = \dots\dots\dots$

Question 5

Multiply out the brackets and then collect *like terms* (5 marks)

- ▶1. $3(x + 2) + 4(x - 3) = \dots\dots\dots$
- ▶2. $6(2p + 1) + 3(3p - 2) = \dots\dots\dots$
- ▶3. $a(2b + 4) + 2a(3b - 2) = \dots\dots\dots$
- ▶4. $9(p + 3) + 12(2p - 1) = \dots\dots\dots$
- ▶5. $12(3q - 4) - 8(5q - 7) = \dots\dots\dots$

Question 6

The power of an electrical circuit (in watts) is given by the formula

$$p = \frac{V^2}{R}$$

If the voltage in the circuit is $V = 240$ volts and the total resistance of the circuit $R = 10\,000$ ohms, calculate the power in the circuit. (3 marks)

Question 7

Work out these fractions, leaving your answer in its simplest form (5 marks)

- ▶1. $\frac{2}{3} + \frac{3}{7} = \dots\dots\dots$
- ▶2. $\frac{5}{4} - \frac{3}{8} = \dots\dots\dots$
- ▶3. $\frac{4}{7} - \frac{1}{2} = \dots\dots\dots$
- ▶4. $\frac{3}{10} + \frac{2}{3} = \dots\dots\dots$
- ▶5. $\frac{3}{5} - \frac{4}{15} = \dots\dots\dots$

Question 8

In my garden, $\frac{4}{7}$ is lawn and $\frac{1}{4}$ is a patio.

- ▶1. How much of the garden is lawn and patio together? (1 mark)

- ▶2. What *fraction* of the garden is left? (1 mark)

- ▶3. What *percentage* of the garden is left? (1 mark)

Question 9

Calculate each of these, giving your answer in its simplest form (4 marks)

- ▶1. $\frac{25}{6} \times \frac{12}{35} = \dots\dots\dots$
- ▶2. $\frac{10}{63} \times \frac{63}{50} = \dots\dots\dots$
- ▶3. $\frac{4}{15} \times \frac{3}{8} = \dots\dots\dots$
- ▶4. $\frac{20}{9} \times \frac{21}{10} = \dots\dots\dots$

Question 10

Give your answer in its simplest form (3 marks)

- ▶1. $\frac{4}{7} \times 161 \text{ m} = \dots\dots\dots$
- ▶2. $\frac{5}{6} \times 63 \text{ g} = \dots\dots\dots$
- ▶3. $\frac{5}{8} \times 60 \text{ GB} = \dots\dots\dots$

Question 11

A baby gorilla weighs 1.25 kg at birth. It grows by the same fraction each month. After 3 months it weighs 7.29 kg. By what fraction does the gorilla grow each month? (5 marks)

Question 12

In a series of exams, Olivia's results were 24 out of 30 in History, 28 out of 30 in Sociology and 23 out of 30 in English. An A grade was 80% or above. Which subjects did she get an A for? Show your working. (5 marks)

Question 13

Give your answer in its simplest form (5 marks)

►1. $A = -4v \times 6 - 10v^2 - 3v \times (-5)$

►2. $B = -k - (-2k) - 4k^2 - 6 - 6k^2 - 1$

►3. $C = -5w^2 - 3w + 2 - 10w^2 - 6w - 1$

►4. $D = 2f^2 + 3f + 4f - (-7) - 3f^2 - (-2)$

►5. $E = 2 \times 2 \times (-4v) - 9v^2 - (-2v)$

Question 14

Expand the following expressions (5 marks)

▶1. $F = (5x + 9)(-9x - 3)$

▶2. $G = (-2x + 9)(7x - 3)$

▶3. $H = (8x - 4)(-x - 10)$

▶4. $I = (9x + 10)(-9x - 7)$

▶5. $J = (-4x - 2)(5x - 1)$