Task 1

1) The ratio of blue to red counters is 2 : 3. What fraction of the counters are blue?

Total parts = 2 + 3 = 5

$$\frac{2}{5}$$

2) The ratio of red to orange sweets is 3 : 7. What fraction of the sweets are orange?

Total parts = 3 + 7 = 10

$$\frac{7}{10}$$

3) A paint mixes yellow and blue in the ratio 4 : 1. What fraction of the paint is yellow?

Total parts = 4 + 1 = 5

$$\frac{4}{5}$$

4) In a cinema the ratio of adults to children is 1 : 6. What fraction of the people are adults?

Total parts = 1 + 6 = 7

$$\frac{1}{7}$$

5) The ratio of right-handed to left-handed pupils in a class is 7 : 2. What percentage of the pupils are left-handed? Give your answer to the nearest percentage.

Total parts = 7 + 2 = 9

$$\frac{2}{9} = 22\%$$

6) A bag has red, green and yellow counters in the ratio 9 : 4 : 7. What percentage of the counters are green?

Total parts = 9 + 4 + 7 = 20

$$\frac{4}{20} = 20\%$$

7) At a school, pupils take Spanish, French and German in the ratio 5 : 9 : 4. What fraction of the pupils do not study Spanish?

Total parts = 5 + 9 + 4 = 18

$$\frac{13}{18}$$

8) A bag contains red and blue counters. $\frac{3}{8}$ of the counters are red. Write the ratio of red to blue counters.   **3 : 5**

9) A drink is made with 30% syrup, and the rest is sparkling water. Write the ratio of syrup to sparkling water in the drink. Give your answer in simplest form.

30 : 70
3 : 7

10) The ratio A : B is 2 : 5. What fraction of the ratio represents A?

Total parts = 2 + 5 = 7

$$\frac{2}{7}$$

11) In a sale $\frac{2}{3}$ of the items in a store are marked down. Write the ratio of the items marked down, to the items that are full priced.   **2 : 1**

12) In a jewellery store, $\frac{4}{11}$ of the jewellery is silver and the rest of the jewellery is gold. Write the ratio of gold jewellery to silver jewellery.   **7 : 4**

13) At a concert the number of adults to children is in the ratio 5 : 2. The children are all either under 10 or over 10. The ratio of children under 10 to children over 10 is 3 : 4. What fraction of all the people at the concert are children under 10?

Fraction of children:
$$\frac{2}{7}$$

Fraction of children under 10:
$$\frac{2}{7} \times \frac{3}{7} = \frac{6}{49}$$

14) On a coach the ratio of teachers to students is 1 : 12. All the students study either science or history. The ratio of science students to history students is 5 : 7. What fraction of all the people on the coach are history students? Give your answer in simplest form.

Fraction of students:
$$\frac{12}{13}$$

Fraction of history students:
$$\frac{12}{13} \times \frac{7}{12} = \frac{84}{156} = \mathbf{\frac{7}{13}}$$

15) In a park the ratio of adults to children is 4 : 1. The children are all either playing football or playing basketball. The ratio of football players to basketball players is 2 : 3. What percentage of all the people in the park are basketball players?

Fraction of children:
$$\frac{1}{5}$$

Fraction of children that play basketball:
$$\frac{1}{5} \times \frac{3}{5} = \frac{3}{25} = \mathbf{12}\%$$

16) In a university the ratio of national to international students is 7 : 3. 40% of the international students are studying engineering. What fraction of all the students in the university are international engineering students? Give your answer in simplest form.

Fraction of international students:
$$\frac{3}{10}$$

Fraction of international engineering students:
$$\frac{3}{10} \times \frac{4}{10} = \frac{12}{100} = \mathbf{\frac{3}{25}}$$

Task 2

17) Given that a : b = 2 : 3 and b : c = 3 : 4, write the ratio a : b : c.

$a : b : c$
2 : 3 : 4

18) Given that p : q = 6 : 7 and q : r = 5 : 9, write the ratio p : q : r.

$p : q$	$q : r$
6 : 7	5 : 9
× 5 × 5	× 7 × 7
30 : 35	35 : 63

$p : q : r$
30 : 35 : 63

19) Given that a : b = 3 : 5 and b : c = 2 : 7, write the ratio a : b : c.

$a : b$	$b : c$
3 : 5	2 : 7
× 2 × 2	× 5 × 5
6 : 10	10 : 35

$a : b : c$
6 : 10 : 35

20) Given that x : y = 4 : 7 and y : z = 3 : 8, write the ratio x : y : z.

$x : y$	$y : z$
4 : 7	3 : 8
× 3 × 3	× 7 × 7
12 : 21	21 : 56

$x : y : z$
12 : 21 : 56

21) Given that m : n = 1 : 6 and m : p = 3 : 10, write the ratio n : p. Give your answer in simplest form.

$m : n$	$m : p$
1 : 6	3 : 10
× 3 × 3	
3 : 18	

$n : p$
18 : 10
9 : 5

22) The ratio of lions to tigers is 7 : 4.
The ratio of bears to lions is 5 : 2.
Find the ratio of tigers to bears.

$L : T$	$B : L$
7 : 4	5 : 2
× 2 × 2	× 7 × 7
14 : 8	35 : 14

$T : B$
8 : 35

23) Amir, Ben and Corey share £212. The ratio of Amir's share to Ben's share is 5 : 3. The ratio of Ben's share to Corey's share is 4 : 7. How much does Corey receive?

$A : B$	$B : C$
$5 : 3$	$4 : 7$
$\times 4 \qquad \times 4$	$\times 3 \qquad \times 3$
$20 : 12$	$12 : 21$

$A : B : C$
$20 : 12 : 21$
$20 + 12 + 21 = 53$
$£212 \div 53 = £4$

Corey receives:
$£4 \times 21 = £\mathbf{84}$

24) Given that m : p = 2 : 9 and n : p = 5 : 6, write the ratio m : n : p.

$m : p$	$n : p$
$2 : 9$	$5 : 6$
$\times 2 \qquad \times 2$	$\times 3 \qquad \times 3$
$4 : 18$	$15 : 18$

$m : n : p$
$\mathbf{4 : 15 : 18}$

25) A survey is taken about vehicles in a car park. The results are expressed in the following ratios, as the numbers of:

Cars : Motorbikes = 5 : 3
Cars : Vans = 10 : 1

If there were 187 vehicles recorded, how many vans were recorded?

$C : M$	$C : V$
$5 : 3$	$10 : 1$
$\times 2 \qquad \times 2$	
$10 : 6$	

$C : M : V$
$10 : 6 : 1$
$10 + 6 + 1 = 17$
$187 \div 17 = 11$

$10 : 6 : 1$
$\times 11 \qquad \times 11$

$110 : 66 : 11$

11 vans were recorded.

Task 3

26) In a fruit basket, there are apples, bananas and oranges. The ratio of apples to fruit that are not apples is 3 : 7. The ratio of bananas to fruit that are not bananas is 2 : 5. Work out the ratio of apples : bananas : oranges.

Make the total parts of the ratio the same (LCM is 70)

$a : n$	$b : n$
$3 : 7$	$2 : 5$
$\times 7 \qquad \times 7$	$\times 10 \qquad \times 10$
$21 : 49$	$20 : 50$

Number of oranges:
$70 - 21 - 20 = 29$

$a : b : o$
$\mathbf{21 : 20 : 29}$

27) A customer feedback survey was given. Each review was positive, neutral or negative. The ratio of positive reviews to not positive reviews was 3 : 2. The ratio of negative reviews to not negative reviews was 2 : 7. Given there were fewer than 100 surveys given, work out the highest number of respondents that gave a negative review.

Make the total parts of the ratio the same (LCM is 45)

$P : O$	$N : O$
$3 : 2$	$2 : 7$
$\times 9 \qquad \times 9$	$\times 5 \qquad \times 5$
$27 : 18$	$10 : 35$

Number of neutral reviews:
$45 - 27 - 10 = 8$

$P : NU : N$
$27 : 8 : 10$
$54 : 16 : 20$ **(90 parts)**
20 respondents

28) **The points A, B, C and D lie in order on a straight line, where**
    AB : BD = 4 : 7 and AC : CD = 5 : 3.
    Work out the ratio AB : BC : CD.

Make the total parts of the ratio the same (LCM is 88)

$AB : BD$	$AC : CD$
$4 : 7$	$5 : 3$
$\times 8 \qquad \times 8$	$\times 11 \qquad \times 11$
$32 : 56$	$55 : 33$

Length of BC:
$88 - AB - CD$
$88 - 32 - 33 = 23$

$AB : BC : CD$
32 : 23 : 33

29) **The points A, B, C and D lie in order on a straight line, where**
    AB : BD = 2 : 9 and AC : CD = 7 : 8.
    Work out the ratio AB : BC : CD.

Make the total parts of the ratio the same (LCM is 165)

$AB : BD$	$AC : CD$
$2 : 9$	$7 : 8$
$\times 15 \qquad \times 15$	$\times 11 \qquad \times 11$
$30 : 135$	$77 : 88$

Length of BC:
$165 - AB - CD$
$165 - 30 - 88 = 47$

$AB : BC : CD$
30 : 47 : 88

Task 4

30) **Given that,**
    A : B = 7 : 2 and C : D = 3 : 8,
    A + B = C + D,
    Work out the ratio A : B : C : D.

Make total parts of the ratio the same (LCM is 99)

$A : B$	$C : D$
$7 : 2$	$3 : 8$
$\times 11 \qquad \times 11$	$\times 9 \qquad \times 9$
$77 : 22$	$27 : 72$

$A : B : C : D$
77 : 22 : 27 : 72

31) **A charity collects a bag of coins. The ratio of the number of 50p coins to the number of 20p coins is 3 : 2. The ratio of the number of 20p coins to the number of 10p coins is 5 : 4. If the total value of all the coins is £103.00, work out how many 50p coins there are.**

Make the parts of the 20p coins the same:

$50p : 20p$	$20p : 10p$
$3 : 2$	$5 : 4$
$\times 5 \qquad \times 5$	$\times 2 \qquad \times 2$
$15 : 10$	$10 : 8$

$50p : 20p : 10p$
$15 : 10 : 8$

Work out the values of the ratio:
50p coins → 15 parts → 15 × 50p = 750p
20p coins → 10 parts → 10 × 20p = 200p
10p coins → 8 parts → 8 × 10p = 80p

$7.50 : 2 : 0.8$

Share £103 in the ratio:
$7.5 + 2 + 0.8 = 10.3$
$103 \div 10.3 = 10$

Number of 50p coins:
$15 \times 10 = 150$

There are 150, 50p coins.