Harder Ratio Problems

(a) The ratio of white socks to black socks is 1 : 4 in a drawer. Four white socks are added to the drawer and the ratio of white socks to black socks becomes 5 : 12. Find the number of white socks and black socks there were initially.

(b) Lily and Mary have marbles in the ratio 5 : 6. Lily gets two more marbles and now the ratio is 7 : 8. How many marbles did each girl have initially?

(c) The ratio of the number of boys to girls at a party is 3 : 4 Six boys leave the party. The ratio of the number of boys to girls at the party is now 5 : 8 Work out the number of girls at the party.

(d) The ratio of pigeons to ducks in a park is 3 : 2. When 5 pigeons fly away, the ratio of pigeons to ducks becomes 5 : 4. How many ducks and pigeons were there originally?

(e) Bill and Chuck share some sweets in the ratio 7 : 3. Bill gives 3 sweets to Chuck and now the ratio is 5 : 3. How many sweets did each have initially?

(f) There are two bags containing counters, bag A and bag B. The ratio of counters in bag A to bag B is 3 : 4. Twelve counters are taken from bag B and added to bag A and the number of counters in each bag is now the same. How many counters were there originally in each bag?

(a)
$$W \quad : \quad B$$
$$x+4 \quad : \quad 4x$$
$$5 \quad : \quad 12$$
$$\Rightarrow 12(x+4) = 20x$$
$$12x + 48 = 20x$$
$$48 = 8x$$
$$x = 6$$

6 white, 24 black

(b)
$$L \quad : \quad M$$
$$5x+2 \quad : \quad 6x$$
$$7 \quad : \quad 8$$
$$\Rightarrow 8(5x+2) = 42x$$
$$16 = 2x$$
$$x = 8$$

Lily 40, Mary 48

(c)
$$B \quad : \quad G$$
$$3x-6 \quad : \quad 4x$$
$$5 \quad : \quad 8$$
$$\Rightarrow 8(3x-6) = 20x$$
$$-48 = 4x$$

$$24x - 48 = 20x$$
$$-48 = -4x$$
$$x = 12$$

48 girls

(d)
$$P \quad : \quad D$$
$$3x-5 \quad : \quad 2x$$
$$5 \quad : \quad 4$$
$$\Rightarrow 12x - 20 = 10x$$
$$2x = 20$$
$$x = 10$$

30 pigeons, 20 ducks

(e)
$$B \quad : \quad C$$
$$7x-3 \quad : \quad 3x+3$$
$$5 \quad : \quad 3$$
$$21x - 9 = 15x + 15$$
$$6x = 24$$
$$x = 4$$

Bill 28, Chuck 12

(f)
$$A \quad : \quad B$$
$$3x+12 \quad : \quad 4x-12$$
$$3x+12 = 4x - 12$$
$$24 = x$$

Bag A 72, Bag B 96