Mixed Fractions, Decimals and Percentages Questions

1. There are 60 beads in a bag. The beads are red, yellow or blue.
   40% of the beads are blue.
   $\frac{5}{12}$ of the beads are red.
   How many beads are yellow?

2. In the sale, jumpers are on the offer "buy 2, save $\frac{1}{3}$ of the price". Jeans are also currently 30% off.
   Jumpers cost £45 each. Jeans cost £50.
   What is the cost of buying 2 jumpers and 2 pairs of jeans?

3. A family discount card offers deals for the cinema. The card states:

Family discount card
45% off all adult tickets
Children save $\frac{2}{5}$ off of full price tickets

   The cost of an adult ticket is £10. A child's ticket is £6.
   (a) How much will it cost to buy 2 adult tickets and 3 children's tickets?
   (b) The cost of a family discount card is £40 per year. How many times in the same year would 2 adults and 3 children need to go before you start to save money on the cost of the card? (Hint: find the cost of the tickets without the discount card)

4. £54 inheritance money is split between Abi, Babs and Caz in the ratio 1:3:2.
   Abi gives 80% of her money to charity.
   Babs gives 0.25 of her money to the same charity.
   Caz also gives $\frac{2}{9}$ of her money to the charity.
   (a) How much money in total do the girls donate to charity?
   (b) Express the amount of money they give to charity as a percentage of the inherited amount to 1 decimal place.

5. At the Redbridge School, $\frac{1}{3}$ of pupils have a pet dog, $\frac{2}{5}$ have a cat and $\frac{1}{15}$ have a hamster. The rest have no pets.
   (a) What fraction of the children has no pet? Write this in its simplest form.
   (b) There are 250 pupils at the Redbridge School. How many children have no pets?
   (c) At the Bluebell School, 23% have no pets. What percentage increase of pupils at the Bluebell School have no pets compared to the Redbridge School?

Solutions

1. (40 ÷ 100) × 60 = 24 blue beads
   (5 ÷ 12) × 60 = 25 red beads
   60 – (24 + 25) = **11 yellow beads**
2. Jumpers: 2 × £45 = £90
   $\frac{1}{3}$ of £90 = £30
   £90 - £30 = £60
   Jeans: 2 × £50 = £100
   (30 ÷ 100) × £100 = £30
   £100 - £30 = £70
   Total: £60 + £70 = **£130**
3. (a) Adults: 2 × £10 = £20
   (45 ÷ 100) x £20 = £9
   £20 - £9 = £11
   Children: 3 × £6 = £18
   $\frac{2}{5}$ of £18 = £7.20
   £18 - £7.20 = £10.80
   Total: £11 + £10.80 = **£21.80**

   (b) Cost without discount = £20 + £18 = £38

	No card	With card
1 trip	1 × £38 = £38	£40 + (1 × £21.80) = £61.80
2 trips	2 × £38 = £76	£40 + (2 × £21.80) = £83.60
3 trips	3 x £38 = £114	£40 + (3 × £21.80) = £105.40

   3 trips before the discount card starts being cheaper than regular price

4. (a) 1 + 3 + 2 = 6 shares
   £54 ÷ 6 = £9 per share
   £9 × 1 : £9 × 3 : £9 × 2 = £9 : £27 : £18
   Abi: (80 ÷ 100) × £9 = £7.20
   Babs: 0.25 × £27 = £6.75
   Caz: $\frac{2}{9}$ × £18 = £4
   Total = £7.20 + £6.75 + £4 = **£17.95**

   (b) (17.95 ÷ 54) × 100 = 33.24074074 = **33.2%**

5. (a) $\frac{1}{3} + \frac{2}{5} + \frac{1}{15} = \frac{5}{15} + \frac{6}{15} + \frac{1}{15} = \frac{12}{15} = \frac{4}{5}$
   $1 - \frac{4}{5} = \mathbf{\frac{1}{5}}$
   (b) $\frac{1}{5}$ × 250 = **50 children**
   (c) $\frac{1}{5}$ = 20%
   23% - 20% = **3% more**