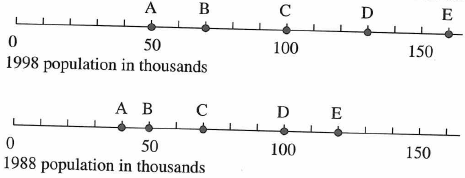
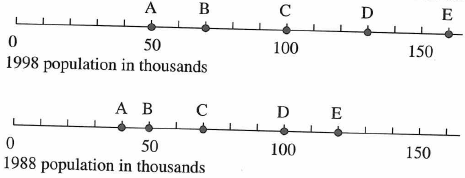
**Year 7 – Percentages Puzzles (Exercise 3)**

1. If 40% of a number is 24, what is the original number?
2. If a price is reduced by 30% to £49, what was the original price?
3. A burger is originally sold for double the price of a hot dog. If the burger is reduced in price by 10%, what percentage more expensive is the burger now?
4. [JMO 2012 A2] Mike drank 60% of his glass of milk. Afterwards, 80 ml of milk remained in the glass. What volume of milk was initially in the glass?
5. [Kangaroo Pink 2007 Q3] An international organisation has 32 members. Every year the number of members increases by 50%. How many members will it have three years from now?
6. Two racoons are initially the same price. One racoon is reduced in price by 60%. What percentage more expensive is the dearer racoon?
7. [SMC 2006 Q8] Matt black paint absorbs 97% of light, the remainder being reflected. Scientists have developed a new superblack coating, “10 times blacker” than matt black paint, meaning it reflects of the light reflected by matt black paint. What percentage of light does the new coating absorb?  
   A 9.7 B 90.3 C 99.7 D 99.9 E 970
8. [JMC 2009 Q16] The kettle in Keith’s kitchen is 80% full. After 20% of the water in it has been poured out, there are 1152ml of water left. What volume of water does Keith’s kitchen kettle hold when it is full?  
   A 1400ml B 1600ml C 1700ml D 1800ml E 2000ml
9. [JMO 1996 A7] When a barrel is 30% empty it contains 30 litres more than when it is 30% full. How many litres does the barrel hold when full?
10. [TMC Regional 2011 Q8] There are 100 students in a school year group. On one day 99% of the students are present. Only 98% of the students with brown hair are present. How many of the 100 students have brown hair?
11. [TMC Regional 2013 Q7] A shopkeeper paid £30 (cost price) for a coat. She wishes to place a price tag on it so that she can offer a 10% discount on the price marked on the tag and still make a profit of 20% on the cost price. What price should she mark on the tag?
12. [SMC 2003 Q9] Mary received a 10% pay rise, and Margaret received a 5% pay rise. This gave them both salaries of £23 100 per year. How much more, per year, did Margaret earn than Mary before they received these pay rises?
13. [JMO 2001 A6] ‘One third of the population now has access to the internet; this is 50% more than one year ago.’  
    What fraction of the population had access to the internet one year ago?
14. [IMC 2003 Q16] After a year’s training, Minnie Midriffe increased her average speed in the London Marathon by 25%. By what percentage did her time decrease?
15. [JMO 2003 A5] Part of a bridge spans a river 35 metres wide. One third of the length of the bridge is on one side of the river and 20% of the length of the bridge is on the other side. How long is the bridge?
16. [Kangaroo Pink 2010 Q2] Ivan, Tibor and Alex sat a test and achieved 85%, 90% and 100% respectively. Tibor scored just one more mark than Ivan. How many marks did Alex get?
17. [IMC 2000 Q20] The populations of five cities A, B, C, D, E in 1988 and 1998 are shown on these scales.  
      
    Which of the five cities showed the largest percentage increase in population from 1988 to 1998?  
    A B C D E
18. [SMC 2007 Q9] In a sale, a shopkeeper reduced the advertised selling price of a dress by 20%. This resulted in a profit of 4% over the cost price of the dress. What percentage profit would the shopkeeper have made if the dress had then been sold at the original selling price?

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**Solutions:**

1. 60
2. £70
3. 80%
4. 200ml
5. 108
6. 150%
7. C
8. D
9. 75
10. 50 students (the one absent person represents 2% of brown-haired people)
11. £40
12. £1000
13. 20%
14. 75m ( was on one side and on the other, representing , thus of the bridge spans the 35m)
15. 20
16. C
17. 30%