

## Compound Percentages

## Section A

1. I invest £500 in an account paying 2% interest per month. How much will I have in:  
a. 3 months  
b. 1 year
2. The tree in my garden, currently 4 metres tall, grows at a rate of 3% per week. How tall will it be in:  
a. 5 weeks  
b. 11 weeks
3. The arctic ice sheets are melting – their area, currently  $405,000\text{km}^2$ , is decreasing by 6% per year. What area will they cover in:  
a. 3 years  
b. 8 years
4. Back to the bank – I invest £4000 in an account paying 4% interest p.a. How much do my descendants have in:  
a. 100 years  
b. 200 years
5. I have an ant farm. The number of ants in my farm increases by 2% every week. I currently have 200,000 ants.  
a. How many will I have in 3 weeks time?  
b. How many did I have 6 weeks ago?
6. My brother has an ant farm which he doesn't look after very well. The number of ants in his farm is falling by 3% weekly. He now has 50,000 ants. How many ants did he have 6 weeks ago?

## Section B

- What is the percentage change from  
a. 45 to 52.2?                      b. 845 to 1047.8?                      c. 45 to 30.6?
- The price of oil rose by 20% in 2003 and by 25% in 2004. What was the overall percentage rise?
- Mr Strong has just got 5% stronger. The maximum weight he can now lift is 882kg. What used to be the maximum weight he could lift?
- The price of a leopard fur coat was cut by 30% in the Harrods sale last week, and then by a further 40% this week. What has been the overall percentage change?
- Mr Tickle's arms have just got 15% longer. They now stretch for 345m. How long were they?
- Mr Silly is getting sillier: each week the number of daft things he does increases by 20%. This week he has done 480 daft things.  
a. How many daft things did he do last week?  
b. How many daft things will he do in a year's time?
- Every month, the prices in shops increase: this is called inflation. The average UK inflation per year is 3.4%. At the moment, my weekly purchase of 40 jaffa cakes costs £9.62  
a. How much will 40 jaffa cakes cost next year?  
b. How much will they cost in 10 years  
c. Bonus question: How much did they cost six months ago?
- Because of global warming, the area covered by the polar ice caps is reducing at a rate of 9% per decade. In 2002, the area of the polar ice caps was 72 800 000 km<sup>2</sup>. What was the area in 1992?

9. Babies grow very rapidly in their first year: the average growth rate is 3.4% per month. My nephew weighed 21.6kg on his first birthday. How much did he weigh when he was born?
10. I have invested some money in a bank account which pays 2% interest per year. In December 2004 I had £1245.72 in the account.
  - a. How much did I have in December 2003?
  - b. How much did I have in June 2003?
11. During the Industrial Revolution, the area of England covered by forest reduced by 11% every five years. In 1835 there were 260 000 km<sup>2</sup> of forest. To the nearest thousand km<sup>2</sup>, what was the area of England covered by forest in 1820?
12. The population of rats in London rose by 14% every year for 15 years, but has fallen by 19% every year for the last decade. What has been the overall percentage change in the rat population?
13. You have £5000 to invest. Which bank will you choose?
  - a. Northern Rock - pays a flat rate of 50% interest at the end of the year.
  - b. Bearings Bank - pays you 25% interest half way through the year, then 25% at the end.
  - c. Lehman Brothers - pays £510 per year for every £1000 you invest.
  - d. Bradford and Bingley - pays 12% at 5 points throughout the year.
  - e. Halifax Bank of Scotland - pays 2% per month but gives a bonus of 20% at the end of the year.
  - f. AIG - pays 10% every other month.
  - g. Goldman Sachs - pays 5% per month but charges £900 at the end of the year.

### **Mixed Percentages – Homework**

1. Increase 320 by 21%
2. Decrease 415 by 37%
3. A waitress gets paid £5.20 an hour but after a pay rise she receives £5.46 an hour. What percentage was her pay rise?
4. A bus driver gets £8.50 an hour but after a pay cut he only gets £6.46 an hour. What percentage was the pay cut?
5. I buy a suit in a sale and it costs me £21.25. The label tells me that this is a 15% reduction on its original price. How much did it cost before the sale?
6. A week later I go back and find that everything has been reduced by a further 50% (after the original 15% reduction). I find a coat that costs £38.25.
  - a) How much was this before the second reduction?
  - b) How much did it cost before either reduction?
7. I'm on a roll when I find a hat which now costs £4.25. How much was it before the sale began?
8. In October a top lawyer from DivorcesRUs is paid £150 an hour. In November he gets a pay rise of 15% and in December he gets a Christmas bonus of 22% of his salary. How much does he get paid per hour in December?
9. In January, the lawyer is paid his November rate of pay but in February one of the partners in DivorcesRUs is involved in a scandal. The company suffers and our lawyer has to take a pay drop of 12%. How much is he paid per hour in February?
10. The hedge in my garden is losing its leaves at a rate of 16% a day. On Monday it had 300,000 leaves.
  - a) How many leaves will it have on Wednesday?
  - b) How many leaves did it have on Sunday?
  - c) How many leaves did it have on Friday?