# Topic Test 1 (20 minutes)

## Growth and decay - Higher

**1** Circle the multipler that is equivalent to a percentage increase of 13%

**[1 mark]**

0.13 1.013 1.13 1.3

**2** Martyn types 2000 into his calculator, then presses the equals key.
The display looks like.


He then types the following and presses the equals key three times.


What value does his calculator finally show?

**[1 mark]**

Answer _____

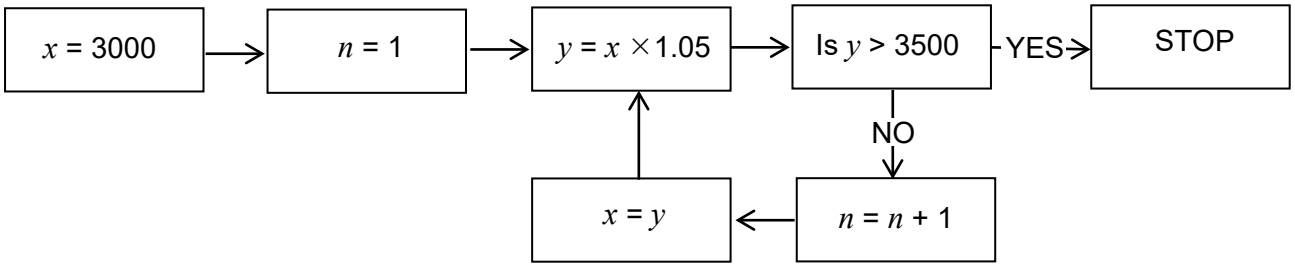
**3** Circle the formula that shows the amount, $A$, in an account when $P$ pounds is invested for $n$ years at an annual compound interest rate of $r$%.

**[1 mark]**

$A = P^n + \left(\frac{Pr}{100}\right)^n$ $A = \left(P + \frac{Pr}{100}\right)^n$

$A = P\left(1 + \frac{r}{100}\right)^n$ $A = P\frac{(100 + r)^n}{100}$

**4** £3000 is invested at an annual compound interest rate of 5%.
This iterative process is used to work out how many years it takes for the investment to reach over £3500




This table shows some of the values generated by the iterative process.

| $x$ | $n$ | $y$ |
|---|---|---|
| 3000 | 1 | 3150 |
| 3150 | 2 | |
| | | |
| | | |
| | | |

Complete the table.
You may not need to use all the rows.
Round values off to 2 decimal places.

**[3 marks]**

**5** Work out the **interest** when £4000 is invested at an annual compound interest rate of 3.8% for 4 years.

**[3 marks]**

Answer £ _____

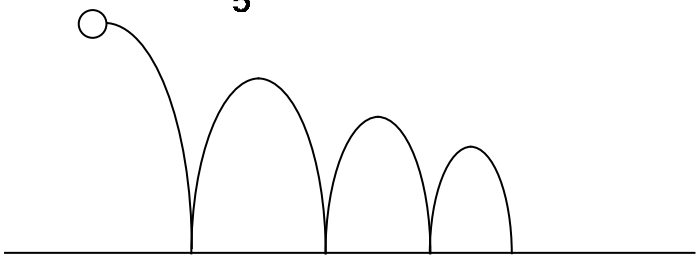
**6** Work out how much will be in the account if £5000 is invested at an annual compound interest rate of 2.9% for 3 years.

**[3 marks]**

Answer £ _____

**7** A ball is dropped from a height of 10 metres.

After each bounce it rises to $\frac{3}{5}$ of its previous height.



Not drawn accurately

How many bounces will it take until it the height reached is less than 1 metre?

**[4 marks]**

Answer _____

**8** A quantity is increased by 10%, then increased by 10%, then decreased by 20%

Which of the following is true for the final value of the quantity?
Circle your answer.

**[1 mark]**

| | |
|---|---|
| Decreases by 4% | Decreases by 3.2% |
| Stays the same | Increases by 1% |

**9** A water tank contains 10 000 litres.
The tank develops a leak and loses 6% of the water remaining each day.
After $n$ days the volume is reduced by almost 50%

Work out the value of $n$.
You **must** explain your method clearly.

**[3 marks]**

Answer _____