

## Topic Check In - 5.03 Discrete growth and decay

1. Decrease £300 by 30%.
2. Increase £250 by 20%.
3. Increase £600 by 12.5%.
4. Abdul is given a 5% pay rise. He is currently earning £20 000 a year. What will his new pay be?
5. Luke is given 1% per annum simple interest on an investment of £1000. How much interest does he earn over 5 years?
6. A plant gets exactly 10% taller each day. On day one it is 200 mm tall. Jane estimates the height after 5 days using the following calculation:

5% of 200 mm is 10 mm  
 $5 \times 10 = 50$  mm so the plant is  $200 + 50 = 250$  mm

Explain whether this is an underestimate or an overestimate.

7. The price of bananas is increased by 10% one week and then reduced by 10% one week later. Is it now back to the original price? Explain your reasoning.
8. The table shows the population,  $P$  thousands (to the nearest thousand), in a town over a period of 4 years.

Years ( $t$ )	0	1	2	3	4
$P$ , thousands	15	18	22	26	31

Show that this table represents an approximate annual population increase of 20%.

9. Karen puts £500 in a bank account. A year later she checks her balance and there is now £510 in the account. What was the percentage interest rate on her account?
10. A bank account contains £1000 at the start of the year. Each month £50 is paid in. By what percentage has the total increased after 1 year?



# GCSE (9–1) MATHEMATICS

## Extension

Invent 5 text messages and write them down. Now write them out again in longhand.

- a) In total, how many letters or numbers did you save yourself keying in by writing the messages in shorthand?
- b) How many key presses did you save yourself?
- c) On average, how many key presses did you save yourself per message?
- d) In general, what percentage of total key presses do you save yourself by texting in shorthand?



# GCSE (9–1) MATHEMATICS

## Answers

1. £210
2. £300
3. £675
4. £21 000
5. £50 interest earned (£1050 in the account)
6. An underestimate as it is actually 10% of the new height each day.
7. No, because it has reduced by 10% of the new price, so it will be cheaper than the original price. For example, £100 increased by 10% becomes £110, but when £110 is reduced by 10% it becomes £99.
8.  $(18 - 15)/15 \times 100 = 20\%$  population increase in the first year, and 22%, 18% and 19% increases in subsequent years.
9. Increased by £10, which is 2% of £500
10.  $50 \times 12 = 600$  (£1600 is in the account). £600 is 60% of £1000.

## Extension

Student responses will vary based on their initial “text messages”.



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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Decrease by a percentage.			
AO1	2	Increase by a simple percentage.			
AO1	3	Increase by a percentage.			
AO1	4	Increase by a percentage in a context.			
AO1	5	Calculate simple interest.			
AO2	6	Understand the concept of compounding.			
AO2	7	Understand the effect of repeated percentage calculations.			
AO2	8	Calculate percentage increase from tabulated results.			
AO3	9	Calculate percentage increase in a problem.			
AO3	10	Calculate percentage increase in a problem.			

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