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 × 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?

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?

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 × 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 × 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.			