Solutions by
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GCSE (9-1) Grade 6 Repeated Percentage Change

Instructions **Unfinished. Please support to inspire me on.**

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – there may be more space than you need.
- **Show all your working out**

Information

- The total mark for this paper is 70.
- The marks for **each** question are shown in brackets.
  – use this as a guide as to how much time to spend on each question.
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed

Advice

- Read each question carefully before you start to answer it
- Attempt every question
- Check your answers if you have time at the end

1. During the sale period, a shop decreases prices by 20% and then by further 30%

Kate says: "Prices have now decreased by 50%"

Is Kate correct?
You must show your working.

100 $\xrightarrow{-20\%}$ 80 $\xrightarrow{-30\%}$ 56

No. Prices have reduced by 44%

£ .....

(Total 2 marks)

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2. The amount of fish in a pond increases by 10% every year.

Find the percentage increase for the amount of fish every 3 years.

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£ .....

(Total 2 marks)

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3. The value of a car depreciates by 25% each year.
At the end of 2013 the value of the car was £4800.

Work out the value of the car at the end of 2015.

£ .....

(Total 3 marks)

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4. A ball fell 2 metres onto horizontal ground.
The ball hit the ground and bounced up and down 3 times.

The first time the ball bounced, it rose to 75% of the height it fell from.
The second time the ball bounced, it rose to 75% of the height it reached after the first bounce.
The third time the ball bounced, it rose to 75% of the height it reached after the second bounce.

Work out the height the ball reached after the third bounce.
Give your answer correct to 2 decimal places.

..... m

(Total 3 marks)

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5. Martin bought a computer for £1200.
At the end of each year the value of the computer is depreciated by 20%.

After how many years will the value of the computer be £491.52?
You must show your working.

.....

(Total 3 marks)

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6. Ria is going to buy a caravan.
The total cost of the caravan is £7000 **plus** VAT at 20%.

Ria pays a deposit of £3000.
She pays the rest of the total cost in 6 equal monthly payments.

Work out the amount of each monthly payment.

£ .....

(Total 4 marks)

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7. Neil invested £500 on 1st January 2000 at a fixed compound interest rate of R% each year.

The value V, in pounds, of this investment after n years is given by the formula

$$V = 500 \times (1.025)^n$$

(*a*) Write down the value of R.

..... **(1)**

(*b*) Use your calculator to find the value of Neil's investment at the end of 12 years.

.....**(2)**

(Total 3 marks)

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8. Amina invested £2500 for n years in a savings account.
She was paid 3% per annum compound interest.

At the end of n years, Aminata has £2813.77 in the savings account.

Work out the value of n.

.....

(Total 2 marks)

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9. The table gives some information about the average price of a litre of petrol in England.

	January 2007	January 2012
Average price of a litre of petrol (pence)	87.3	133.3

The average price of a litre of petrol in England increased by 20% from January 2010 to January 2012.

Work out the average price of a litre of petrol in England in January 2010.

Give your answer in pence, correct to 1 decimal place.

..... pence

(Total 3 marks)

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10. Mia invests £4000 in a savings account for 3 years.
She gets 3% per annum compound interest in the first year, then x% for 2 years.

Mia has £4413.45 at the end of 3 years, work out the value of x

.....

(Total 4 marks)

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11. John invests £3500 in a savings account for 3 years.
She gets 2% per annum compound interest in the first year, then x% for 2 years.

John has £3855.76 at the end of 3 years, work out the value of x

.....

(Total 4 marks)

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12. The population of a bacteria increases by x% each year
The population is expected to increase by 40% in 5 years, work out the value of x

Give your answer to 1 decimal place

.....

(Total 3 marks)

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13. The number of fish decreases by x % each year.

Given that the number of fish halves in 6 years, work out the value of x.
Give your answer correct to 1 decimal place.

.....

(Total 3 marks)

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14. The value of car depreciates by x % each year.

Given that the car value will depreciate by 70% in 7 years, work out the value of x.
Give your answer correct to 2 decimal places.

.....

(Total 3 marks)

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15. The population of Hilford City is increasing by x% each year
The population is expected to double in 4 years, work out the value of x

Give your answer to 1 decimal place

.....

(Total 3 marks)

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16. A radius of a circle increases by 6%
Find the increase in the area of the circle

Give your answer to 1 decimal place

.....

(Total 4 marks)

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17. An area of a circle increases by 4%
Find the increase in the radius of the circle

Give your answer to 1 decimal place

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(Total 4 marks)

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18. A length of a cube increases by 15%
Find the increase in the volume of the cube

Give your answer to 2 decimal places

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(Total 4 marks)

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19. A volume of a cube increases by 28%
Find the increase in the length of the cube

Give your answer to 3 significant figures.

.....

(Total 4 marks)

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20. $F = \frac{mp}{r^2}$

The value of r decreases by 25%.

Th value of m and the value of p are not changed

Calculate the percentage increase in the value of F

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(Total 3 marks)

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21. $V = \frac{pq}{\sqrt{r}}$

The value of r increases by 20%.

The value of p and the value of q are not changed

Calculate the percentage decrease in the value of V

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(Total 3 marks)

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22. $A = \frac{Gm}{b^3}$

The value of b increases by 30%

The value of G and the value of m are not changed

Calculate the percentage decrease in the value of A

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(Total 3 marks)

TOTAL FOR PAPER IS 70 MARKS