





Higher GCSE Revision - Exam Style Questions

Percentages Using A Calculator (Total - 33 marks)

Topics covered in this video...

-  Increasing/decreasing an amount by a percentage
-  Percentage change
-  Reverse percentages
-  Compound interest

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1. (a) Mrs Brown's bill for servicing her car is £96 plus VAT.
VAT is charged at 17.5%.

What is her total bill?

$$\text{orig} \times \text{p.m.} = \text{new}$$

$$96 \times 1.175 = \underline{\underline{£112.80}}$$

$$\text{orig} = £96$$

$$\text{p.m.} = 1.175$$

$$117.5\% \rightarrow \text{decimal} \quad (\div 100)$$

(3)

- (b) Mr Smith's bill for servicing his car is £185.65 including VAT.
How much was his bill before VAT was added?

$$\text{orig} \times \text{p.m.} = \text{new}$$

$$\text{orig} \times 1.175 = 185.65$$

$$\text{orig} = \frac{185.65}{1.175}$$

$$= \underline{\underline{£158}}$$

$$\text{new} = £185.65$$

$$\text{orig} = ?$$

$$\text{p.m.} = 1.175$$

(3)

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2. Jane earns £11 400 per year.
After her pay rise she earns £12 198 per year.

What was her percentage pay rise?

$$\begin{aligned}\% \text{ change} &= \frac{\text{actual change}}{\text{orig}} \times 100 \\ &= \frac{12198 - 11400}{11400} \times 100 \\ &= \underline{7\%}\end{aligned}$$

$$\text{orig} \times \text{pm} = \text{new}$$

$$11400 \times \text{pm} = 12198$$

$$\text{pm} = \frac{12198}{11400}$$

$$= 1.07$$

increase of 7%

(3)

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3. (a) Miss Evans earns £240 per week. ^{orig} 103.5%
She is awarded a pay rise of 3.5%.
Mr Dale earns £220 per week. 104%
He is awarded a pay rise of 4%.

Whose weekly pay increases by the greater amount of money?

You **must** show all your working.

$$\text{orig} = \pounds 240 \quad \text{pm} = 1.035$$

$$\begin{aligned} \text{new} &= 240 \times 1.035 \\ &= \pounds 248.40 \end{aligned}$$

$$248.40 - 240 = \pounds 8.40$$

$$\text{orig} = \pounds 220 \quad \text{pm} = 1.04$$

$$\begin{aligned} \text{new} &= 220 \times 1.04 \\ &= \pounds 228.80 \end{aligned}$$

$$228.80 - 220 = \pounds 8.80$$

Mr Dale's pay has increased by the greater amount.

(4)

- (b) In 2003 the State Pension was increased by 2% to £78.03.
What was the State Pension before this increase? ^{orig} 102%

$$\text{new} = \pounds 78.03$$

$$\text{pm} = 1.02$$

$$\text{orig} \times \text{pm} = \text{new}$$

$$\text{orig} \times 1.02 = 78.03$$

$$\text{orig} = \frac{78.03}{1.02} = \pounds 76.50$$

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4. During 2003 the average wage earned by some factory workers in Barnsley rose from £350 to £372.
What was the percentage increase?

$$\begin{aligned} \% \text{ change} &= \frac{\text{actual change}}{\text{orig}} \times 100 \\ &= \frac{372-350}{350} \times 100 \\ &= \underline{\underline{6.29\%}} \end{aligned}$$

$$\text{orig} \times \text{pm} = \text{new}$$

$$\begin{aligned} 350 \times \text{pm} &= 372 \\ \text{pm} &= \frac{372}{350} \end{aligned}$$

$$= 1.06285 \quad (3)$$

$$\% \text{ increase} = \underline{\underline{6.29\%}}$$

- (b) During 2003 the number of people out of work in Barnsley fell by 8%. — 92%
At the end of the year there were 2576 people out of work in Barnsley.

How many people were out of work at the beginning of the year?

$$\begin{aligned} \text{new} &= 2576 \\ \text{orig} &= ? \\ \text{pm} &= 0.92 \end{aligned}$$

$$\text{orig} \times \text{pm} = \text{new}$$

$$\text{orig} \times 0.92 = 2576$$

$$\text{orig} = \frac{2576}{0.92}$$

$$= \underline{\underline{2800}}$$

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5. A camera is advertised in two shops.

VAT is 17.5% \rightarrow 117.5%

In which shop is the camera cheaper and by how much?

Dicksons Camera

orig = £330

pm = 1.175

$$\text{new} = 330 \times 1.175$$

$$= \underline{\underline{£387.75}}$$

Carry's electrical is cheaper by $\underline{\underline{£2.75}}$

Dicksons Cameras

Sonny DC-23



£330 plus VAT

Carry's Electrical

Sonny DC-23



£385 including VAT

$$387.75 - 385 = \underline{\underline{£2.75}}$$

(4)

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6. £4500 is invested at 3.2% compound interest per annum.
How many years will it take for the investment to exceed £5000?

$$\text{new} = \text{orig} \times \text{pm}^n$$

$$\textcircled{1} \quad 4500 \times 1.032 = \cancel{£}4644$$

$$\textcircled{2} \quad 4644 \times 1.032 = \cancel{£}4792.61$$

$$\textcircled{3} \quad 4792.61 \times 1.032 = \cancel{£}4945.97$$

$$\textcircled{4} \quad 4945.79 \times 1.032 = \underline{\underline{£5104.24}} \quad (3)$$

4 years

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7. John has £2000 to invest.
He sees this advert.

Will John double his money in ten years with SureFire Investments?
You **must** show your working.

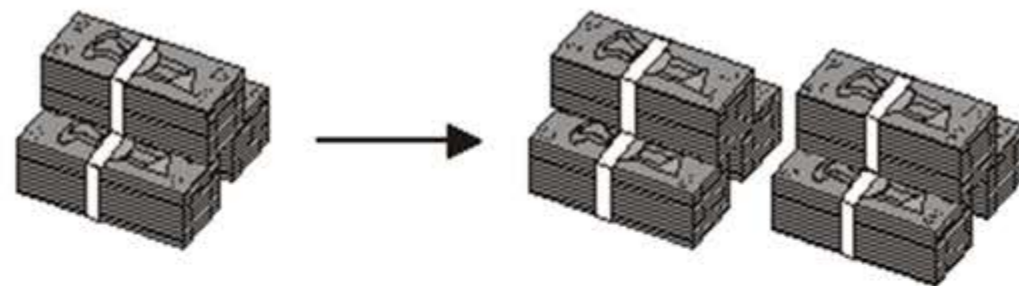
Compound interest: $pm = 1.072$

$$\text{new} = 2000 \times 1.072^{10}$$

$$= \underline{\underline{£4008.46}}$$

Yes, John will double his money in 10 years.

Double your money in 10 years!



The average annual growth of our investment
account is 7.2%

107.2%

(4)

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