R30...Compound Interest-Growth and Decay (Reverse)

OCR

15 Ratna invests £1200 for 2 years in a bank account paying r % per year compound interest.
At the end of 2 years, the amount in the bank account is £1379.02.

Calculate r.

$r =$ ..... **[4]**

rate

Created by W Neill

15 Ratna invests £1200 for 2 years in a bank account paying r % per year compound interest.
At the end of 2 years, the amount in the bank account is £1379.02.

R30

Calculate r.

$1200 \times ?^2 = 1379.02$

$?^2 = 1.149....$

$? = \sqrt{1.149}$

$? = 1.07199$

$r = 0.07199$

$= 7.199\%$

$r =$ ..... **[4]**

Edexcel

Video created by W Neill

8 Simon invested an amount of money in a savings account at 0.5% per annum compound interest.
At the end of 3 years, the amount of money in the savings account was £12 180.90

R30 Work out how much money Simon invested in the savings account.
You must show your working.

£.....

(Total for Question 8 is 3 marks)

Video created by W Neill

8 Simon invested an amount of money in a savings account at 0.5% per annum compound interest.
At the end of 3 years, the amount of money in the savings account was £12 180.90

R11 Work out how much money Simon invested in the savings account.
R30 You must show your working.

x4=12

$x \times 1.005^3 = £12180.90$

£ 12,000

(Total for Question 8 is 3 marks)

Video created by W Neill

10 Naoby invests £6000 for 5 years.
The investment gets compound interest of x% per annum.

At the end of 5 years the investment is worth £8029.35

Work out the value of x.

.....

(Total for Question 10 is 3 marks)

Video created by W Neill

10 Naoby invests £6000 for 5 years.
The investment gets compound interest of x% per annum.

At the end of 5 years the investment is worth £8029.35

Work out the value of x.

1.1 → 10%.
1.01 = 1%.
1.05999
5.9%.

$$6000 \times x^5 = 8029.35$$

$$x^5 = \frac{8029.35}{6000}$$

$$x^5 = 1.338225$$

$$x = \sqrt[5]{1.338225}$$

$$x = 1.05999$$

5.99%

(Total for Question 10 is 3 marks)

13 At the beginning of 2009, Mr Veale bought a company.
The value of the company was £50 000

Each year the value of the company increased by 2%.

(a) Calculate the value of the company at the beginning of 2017
Give your answer correct to the nearest £100

£.....

(2)

At the beginning of 2009 the value of a different company was £250 000
In 6 years the value of this company increased to £325 000

This is equivalent to an increase of x% each year.

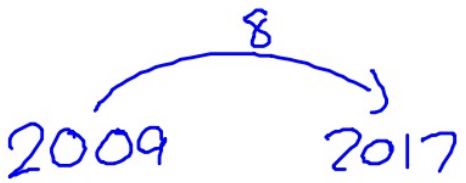
(b) Find the value of x.
Give your answer correct to 2 significant figures.

.....

(3)

(Total for Question 13 is 5 marks)

Created by W Neill



13 At the beginning of 2009, Mr Veale bought a company.
The value of the company was £50 000

Each year the value of the company increased by 2%.

(a) Calculate the value of the company at the beginning of 2017
Give your answer correct to the nearest £100

£50000 × 1.02^{8} =

£58600

£.....

(2)

At the beginning of 2009 the value of a different company was £250 000
In 6 years the value of this company increased to £325 000

This is equivalent to an increase of x% each year.

(b) Find the value of x.
Give your answer correct to 2 significant figures.

$? = 1.04469$

100%.

$£250{,}000 \times ?^{6} = 325000$

$x = 4.469\%$

$?^{6} = 1.3$

$? = \sqrt[6]{1.3}$

4.5%

(3)

(Total for Question 13 is 5 marks)

9 Jack bought a new boat for £12 500

The value, £V, of Jack's boat at the end of n years is given by the formula

$$V = 12\,500 \times (0.85)^n$$

(a) At the end of how many years was the value of Jack's boat first less than 50% of the value of the boat when it was new?

.....

(2)

A savings account pays interest at a rate of $R\%$ per year.
Jack invests £5500 in the account for one year.

At the end of the year, Jack pays tax on the interest at a rate of 40%.
After paying tax, he gets £79.20

(b) Work out the value of R.

.....

(3)

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The value, £V, of Jack's boat at the end of n years is given by the formula

$$V = 12\,500 \times (0.85)^n$$

(a) At the end of how many years was the value of Jack's boat first less than 50% of the value of the boat when it was new?

£12500 ÷ 2 = £6250 ← 50%

£12500 × 0.85^5 = £5546

5 years as £5546 < £6250 ✓

.....

(2)

A savings account pays interest at a rate of $R\%$ per year.
Jack invests £5500 in the account for one year.

At the end of the year, Jack pays tax on the interest at a rate of 40%.
After paying tax, he gets £79.20

(b) Work out the value of R.

÷6 (£79.20 = 60%
£13.20 = 10%) ÷6
£132 = 100%

£5500 × [%] = £132

$\% = \frac{135}{5500}$

$= 0.024$

2.4%

(3)

9 Jean invests £12 000 in an account paying compound interest for 2 years.

R11 In the first year the rate of interest is $x\%$

R30 At the end of the first year the value of Jean's investment is £12 336

In the second year the rate of interest is $\frac{x}{2}\%$

What is the value of Jean's investment at the end of 2 years?

£.....

(Total for Question 9 is 4 marks)

9 Jean invests £12 000 in an account paying compound interest for 2 years.

R11 In the first year the rate of interest is x%

R30 At the end of the first year the value of Jean's investment is £12 336

$\frac{x}{2} = 1.4i.$

In the second year the rate of interest is $\frac{x}{2}$%

What is the value of Jean's investment at the end of 2 years?

Yr 1

$12000 \times \boxed{x\%} = £12336$

1.028

$2.8i.x$

Yr 2

$£12336 \times 1.014 =$

£ 12508.70 ✓

(Total for Question 9 is 4 marks)

AQA