1. At what interest rate, compounded annually, would you need to invest $100 in order to have $125 in 2 years?

Working:

Answer:

……..

(Total 4 marks)

2. The rate of inflation from the beginning of 1995 has been 4.5% per year.

(a) A loaf of bread cost $1.70 on January 1, 1996. What did it cost on January 1, 1999?

(b) A car cost $40 000 on January 1, 1999. What did it cost on January 1, 1997? **(Give your answer to the nearest thousand dollars.)**

Working:

Answers:

(a) .....

(b) .....

(Total 4 marks)

3. Mario has spent $40000 to buy some land. The land increases in value by 5% each year.

(i) What is the value of the land after the end of five years?

At the end of five years, Mario sells the land. He pays 1% tax on the sale and spends the rest of the money on a car. The car loses value at a rate of $2500 every year.

(ii) How much tax does Mario pay?

(iii) How much is the car worth five years after Mario buys it?

Working:

Answers:

(i) .....

(ii) .....

(iii) .....

(Total 8 marks)

4. Bob invests 600 EUR in a bank that offers a rate of 2.75% compounded annually. The interest is added on at the end of each year.

(a) Calculate how much money Bob has in the bank after 4 years.

(b) Calculate the number of years it will take for the investment to double.

Ann invests 600 EUR in another bank that offers interest compounded annually. Her investment doubles in 20 years.

(c) Find the rate that the bank is offering.

(Total 6 marks)

5. Emma places €8000 in a bank account that pays a nominal interest rate of 5% per annum, compounded quarterly.

(a) Calculate the amount of money that Emma would have in her account after 15 years. Give your answer correct to the nearest Euro.

(3)

(b) After a period of time she decides to withdraw the money from this bank. There is €9058.17 in her account. Find the number of months that Emma had left her money in the account.

(3)

Working:

Answers:

(a) .....

(b) .....

(Total 6 marks)

1. $A = C\left(1+\frac{r}{100}\right)^n$

$125 = 100\left(1+\frac{r}{100}\right)^2$ (M1)

$1.25 = \left(1+\frac{r}{100}\right)^2$ (M1)

$1.11803398 - 1 = \frac{r}{100}$ (M1)

$r = 11.8\%$ (3 s.f.) (A1) (C4)

[4]

2. (a) $A = 1.70\left(1+\frac{4.5}{100}\right)^3$ (M1)

$= \$1.939982413$

$= \$1.94$ (3 s.f.) (A1)

(b) $40000 = C\left(1+\frac{4.5}{100}\right)^2$ (M1)

$\frac{40000}{1.045^2} = C$

$\$36629.19805 = C$

$\$37000 = C$ (to the nearest thousand dollars) (A1)

Note: *Accuracy is specified in the question, therefore this is not a paper accuracy penalty.*

[4]

3. (i) $40000 \times (1.05)^5 = 51051.26$ (M1)(A1)

(ii) $51051.26 \times 1\% = \$510.51$ (accept \$511). (M1)(A1)

(iii) $51051.26 - 510.51 = 50540.75$ (M1)(A1)

$50540.75 - 5 \times 2500 = \$38040.75$ (accept \$38 000). (M1)(A1)

[8]

4. (a) $600\left(1+\frac{2.75}{100}\right)^4 = 668.77$ (accept 669) (M1)(A1)

OR

669 (G2) (C2)

(b) $600\left(1+\frac{2.75}{100}\right)^{n} = 1200$ (M1)

$n = 25.6$

$n = 26$ (A1)

OR

26 (G2) (C2)

(c) $600\left(1+\frac{r}{100}\right)^{20} = 1200$ (M1)

$1 + \frac{r}{100} = 1.03526$

$r = 3.53\%$ (A1)

OR

3.53% (G2) (C2)

[6]

5. (a) $FV = 8000\ (1.0125)^{60}$ (M1)(A1)

Note: *(M1) for substituting in compound interest formula, (A1) for correct substitution*

€16857 only (A1) (C3)

(b) $8000\ (1.0125)^{n} = 9058.17$ (M1)

Note: *(M1) for equating compound interest formula to 9058.17*

n =10 *correct answer only* (A1)

So 30 months, (ft) on their n (A1)(ft)

Note: *Award (C2) for 2.5 seen with no working* (C3)

[6]