



Exponential Growth & Decay (inc Compound Interest)

Question Paper 1

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Number
Sub-Topic	Exponential Growth & Decay (inc Compound Interest)
Booklet	Question Paper 1

Time Allowed: 69 minutes

Score: /57

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

- 1 It is estimated that the world's population is growing at a rate of 1.14% per year.
On January 1st 2014 the population was 7.23 billion.

(a) Find the expected population on January 1st 2020.

.....billion [2]

(b) Find the year when the population is expected to reach 10 billion.

..... [2]

- 2 At the start of an experiment there are 20 000 bacteria.
The number of bacteria increases at a rate of 30% per hour.

(a) Work out the number of bacteria after 4 hours.

..... [2]

(b) After how many **whole** hours, from the start of the experiment, will the number of bacteria be greater than one million?

..... hours [2]

- 3 (a) (i) Eduardo invests \$640 at a rate of 2% per year compound interest.

Show that, at the end of 6 years, Eduardo has \$721, correct to the nearest dollar.

Answer(a)(i)

[2]

- (ii) Manuela also invests \$640.
At the end of 4 years, Manuela has \$721.

Find the yearly compound interest rate.

Answer(a)(ii) % [4]

- (b) Carlos buys a motor scooter for \$1200.
Each year the value of the scooter decreases by 10% of its value at the beginning of that year.

Find the value of the scooter after 3 years.

Answer(b) \$ [2]

- 4 The population of Olton is decreasing at a rate of 3% per year.
In 2013, the population was 50 000.

Calculate the population after 4 years.
Give your answer correct to the nearest hundred.

Answer [3]

- 5 Alex invests \$200 for 2 years at a rate of 2% per year simple interest.
Chris invests \$200 for 2 years at a rate of 2% per year compound interest.

Calculate how much more interest Chris has than Alex.

Answer \$ [4]

- 6 Maryah borrows \$12 000 to start a business.
The loan is for 3 years at a rate of 5% per year compound interest.
The loan has to be paid back at the end of the 3 years.

Calculate the total amount to be paid back.

Answer \$ [3]

- 7 Bruce invested \$420 at a rate of 4% per year compound interest.

Calculate the **total** amount Bruce has after 2 years.
Give your answer correct to 2 decimal places.

Answer \$ [3]

- 8 Carol invests \$6250 at a rate of 2% per year compound interest.

Calculate the **total** amount Carol has after 3 years.

Answer \$ [3]

- 9 Acri invested \$500 for 3 years at a rate of 2.8% per year compound interest.

Calculate the final amount he has after 3 years.

Answer \$ [3]

- 10 Boris invests \$280 for 2 years at a rate of 3% per year compound interest.

Calculate the interest Boris receives at the end of the 2 years.
Give your answer correct to 2 decimal places.

Answer \$ [4]

- 11 Pedro invested \$800 at a rate of 5% per year **compound** interest.
Calculate the **total** amount he has after 2 years.

Answer \$ [2]

12 Eva invests \$120 at a rate of 3% per year **compound interest**.

Calculate the total amount Eva has after 2 years.
Give your answer correct to 2 decimal places.

Answer \$ [3]

13 Johan invested \$600 for 3 years at 4% per year **compound interest**.

Calculate the final amount he had after three years.

Answer \$ [3]

- 14 Nikhil invests \$200 for 2 years at 4% per year **compound** interest.
Calculate the **exact** amount Nikhil has after 2 years.

Answer \$ [2]

- 15 Zainab borrows \$198 from a bank to pay for a new bed.
The bank charges compound interest at 1.9% per month.
Calculate how much **interest** she owes at the end of 3 months.
Give your answer correct to 2 decimal places.

Answer \$ [3]

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16

NORTH EASTERN BANK
SAVINGS ACCOUNT

5%

Per Year

Simple Interest

SOUTH WESTERN BANK
SAVINGS ACCOUNT

4.9%

Per Year

Compound Interest

Kalid and his brother have \$2000 each to invest for 3 years.

- (a) North Eastern Bank advertises savings with **simple** interest at 5% per year.
Kalid invests his money in this bank.
How much money will he have at the end of 3 years?

Answer(a)\$ [2]

- (b) South Western Bank advertises savings with **compound** interest at 4.9% per year.
Kalid's brother invests his money in this bank.
At the end of 3 years, how much **more** money will he have than Kalid?

Answer(b)\$ [3]