

Q Simple and Compound Interest

- 5 Jo invests \$600 for 7 years at a rate of 1.5% per year simple interest.

Calculate the total interest earned during the 7 years.

\$ [2]

- 4 Shubhu invests \$750 in a savings account for 5 years.
The account pays simple interest at a rate of 1.8% per year.

Calculate the total interest she earns during the 5 years.

\$ [2]

- 12 (a) Sanjay invests \$700 in an account paying simple interest at a rate of 2.5% per year.

Calculate the value of his investment at the end of 6 years.

\$ [3]

- (b) Ali invests \$600 at a rate of 2% per year simple interest.

Calculate the value of Ali's investment at the end of 5 years.

\$ [3]

- 3 Sally invests \$1500 at 3% per year simple interest.

Work out the total value of her investment at the end of 6 years.

\$ [3]

- 5 (a) \$500 is invested at a rate of 3% per year.

Calculate the total interest earned at the end of 7 years when

- (i) simple interest is paid,

\$ [2]

- (ii) compound interest is paid.

\$ [3]

- (d) Malena invests \$1800 at a rate of 2.1% per year compound interest.

Calculate the value of her investment at the end of 15 years.

\$ [2]

- 12 Keita invests \$4000 at a rate of 2.6% per year compound interest.

Work out the interest earned on the investment at the end of 3 years.

\$ [3]

- (d) In 2015, a charity raised a total of \$1.6 million.
After 2015, this amount increased exponentially by 2.4% each year for the next 5 years.

Work out the amount raised by the charity in 2020.

\$ million [2]

- 10 A town has a population of 45 000.
This population increases exponentially at a rate of 1.6% per year.

Find the population of the town at the end of 5 years.
Give your answer correct to the nearest hundred.

..... [3]

- (c) (i) Dean invests \$500 for 10 years at a rate of 1.7% per year simple interest.

Calculate the total interest earned during the 10 years.

\$ [2]

- (ii) Ollie invests \$200 at a rate of 0.0035% **per day** compound interest.

Calculate the value of Ollie's investment at the end of 1 year.

[1 year = 365 days.]

\$ [2]

- 13** At the end of 2021 there were 27 000 rhinos living in the wild.
The number of rhinos is expected to decrease exponentially by 3% each year.

Work out the number of rhinos expected to be living in the wild 4 years later, at the end of 2025.
Give your answer correct to the nearest whole number.

..... [3]

- 13** The population of one variety of butterfly is decreasing exponentially at a rate of 34% per year.
At the end of 2014, the population was 125.9 million.

Calculate the population at the end of 2019.

..... million [2]

- 15** The number of trees in a forest is decreasing exponentially at a rate of 1.75% per year.
Eleven years ago there were 980 trees.

Calculate the number of trees in the forest now.
Give your answer correct to the nearest integer.

..... [2]

- 12** The population of a town decreases exponentially at a rate of 1.7% per year.
The population now is 250 000.

Calculate the population at the end of 5 years.
Give your answer correct to the nearest hundred.

..... [3]

- 12** The profit a company makes decreases exponentially at a rate of 0.9% per year.
In 2014, the profit was \$9500.

Calculate the profit in 2019.

\$ [2]

12 Chai invests some money.

By the end of the first year, the value of the investment has decreased by 35%.

By the end of the second year, the value of the investment has increased by 40% of its value at the end of the first year.

Find the overall percentage change in the value of the investment.

..... % [3]

(c) Anil invests \$3500 in an account that pays a rate of 2.4% per year compound interest.

(i) Calculate the total interest earned at the end of 5 years.

\$ [3]

(ii) Find the number of complete years before Anil has at least \$5000 in this account.

..... years [3]

(d) The mass of a radioactive substance decreases exponentially at a rate of 3% each day.

(i) Find the overall percentage decrease at the end of 10 days.

..... % [2]

(ii) Find the number of whole days it takes until the mass of this substance is one half of its original amount.

..... [3]

- 4 (a) (i) Zak invests \$500 at a rate of 2% per year simple interest.

Calculate the value of Zak's investment at the end of 5 years.

\$ [3]

- (ii) Yasmin invests \$500 at a rate of 1.8% per year compound interest.

Calculate the value of Yasmin's investment at the end of 5 years.

\$ [2]

(iii) Zak and Yasmin continue with these investments.

How many **more complete** years is it before the value of Yasmin's investment is greater than the value of Zak's investment?

..... [3]

- 9 (a) Janna and Kamal each invest \$8000.
At the end of 12 years, they each have \$12 800.

- (i) Janna invests in an account that pays simple interest at a rate of $r\%$ per year.

Calculate the value of r .

$$r = \dots\dots\dots [3]$$

- (ii) Kamal invests in an account that pays compound interest at a rate of $R\%$ per year.

Calculate the value of R .

$$R = \dots\dots\dots [3]$$

- (b) The population of a city is growing exponentially at a rate of 1.8% per year.
The population now is 260 000.

Find the number of complete years from now when the population will first be more than 300 000.

..... years [3]

- (c) Kamal invests \$6130 at a rate of $r\%$ per year compound interest.
The value of his investment at the end of 5 years is \$6669.

Calculate the value of r .

$$r = \dots\dots\dots [3]$$

- 13 Anya invests \$6000 in an account that pays compound interest at a rate of $r\%$ per year.
At the end of 8 years, the account has earned \$621.70 in interest.

Calculate the value of r .

$$r = \dots\dots\dots [3]$$

- 14** Carlos invests \$4540 at a rate of $r\%$ per year compound interest.
At the end of 10 years he has earned \$1328.54 in interest.

Calculate the value of r .

$r = \dots\dots\dots$ [3]

- (b)** The value of a car decreases exponentially by 10% each year.
The value now is \$6269.40 .

Calculate the value of the car 3 years ago.

\$ \dots\dots\dots [3]

- 11 (a)** Midhil invests \$1500 at a rate of 4.2% per year compound interest.

Calculate the value of the investment at the end of 5 years.

\$ [2]

- (b)** Hitanshi invests some money at a rate of $x\%$ per year compound interest.
At the end of 11 years the value of the investment has doubled.

Calculate the value of x .

$x =$ [3]

- (b)** Alain invests \$5000 at a rate of $r\%$ per year compound interest.
At the end of 15 years, the value of the investment is \$7566.

Find the value of r .

$r =$ [3]

- (c) Feri invests some money.
The rate of interest for the first year is 2.5%.
At the end of the second year the overall percentage increase of Feri's investment is 6.6%.

Find the rate of interest for the second year.

..... % [2]

- (e) The value of the campsite has increased exponentially by 1.5% every year since it opened 30 years ago.

Calculate the value of the campsite now as a percentage of its value 30 years ago.

..... % [2]

- (iv) The average attendance increased exponentially by 4% each year for the three years from 2016 to 2019.

In 2019 the average attendance was 1631.

Find the average attendance for 2016.

..... [3]

- 16 Paddy and Anna each invest \$2000 for 5 years.
Paddy earns simple interest at a rate of 1.25% per year.
Anna earns compound interest at a rate of $r\%$ per year.
At the end of 5 years, Paddy's investment is worth the same as Anna's investment.

Calculate the value of r .

$r =$ [5]

- (b) Virat has \$100 to spend.

In February he spends \$ x .

In March he spends 10% more than he spends in February.

In April he spends 10% more than he spends in March.

At the end of April, Virat has \$33.80 remaining.

Find the value of x .

$x = \dots\dots\dots$ [3]

- (c) Bobbie invests \$500 in an account that pays compound interest each year.
At the end of 17 years, the value of Bobbie's investment is \$700.13 .

Find the value of Bobbie's investment at the end of 20 years.

\$..... [4]