Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Interest, growth and decay

Time allowed: 1 hour 5 minutes

Subject code **0580**

Mathematics

Questions from Paper 1, Paper 2, Paper 3 and Paper 4

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
You may use a calculator.

Total marks

/ 52

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 52 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

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Print at 100% (Actual size) so diagrams keep their real measurements.

1 Nerina invests \$5400 at a rate of r% per year simple interest.
At the end of 3 years, the total interest earned is \$429.30 .

Calculate the value of r.

$r =$ ..... [2]

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2 Robert buys a car for \$8000.
At the end of each year the value of the car has decreased by 10% of its value at the beginning of that year.

Calculate the value of the car at the end of 7 years.

Answer \$ ..... [2]

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3 Jo invests \$500 at a rate of 2% per year compound interest.

Calculate the amount of interest earned at the end of 7 years.

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\$ ..... [3]

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4 The population of Dubai at the end of 2012 was 2.1 million.
This was predicted to increase at a rate of 6% each year.

Calculate the predicted population of Dubai at the end of 2015.

Answer ..... million [3]

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5 Eric invests an amount in a bank that pays compound interest at a rate of 2.16% per year.
At the end of 5 years, the value of his investment is $6 999.31 .

Calculate the amount Eric invests.

$..... [3]

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6 Sonia wants to invest \$5000 for 6 years.

Bank A pays compound interest at a rate of 3.5% per year.
Bank B increases the \$5000 by 22% at the end of 6 years.

Which bank will give Sonia the most money at the end of 6 years and by how much?
You must show all your working.

Bank A

Bank B

Bank ..... will give \$ ..... more money. [5]

Interest, growth and decay Click for more variations

7 Marcel invests \$2500 for 3 years at a rate of 1.6% per year simple interest.
Jacques invests \$2000 for 3 years at a rate of x% per year compound interest.
At the end of the 3 years Marcel and Jacques receive the same amount of interest.

Calculate the value of x correct to 3 significant figures.

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$x =$ ..... [5]

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8 **(a)** Dina invests \$600 for 5 years at a rate of 2% per year compound interest.

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

\$ ..... [2]

(b) The value of a gold ring increases exponentially at a rate of 5% per year.
The value is now \$882.

(i) Calculate the value of the ring 2 years ago.

\$ ..... [2]

(ii) Find the number of complete years it takes for the ring's value of \$882 to increase to a value greater than \$1100.

..... [2]

(a) Interest, growth and decay (b)(i) Interest, growth and decay (b)(ii) Interest, growth and decay

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9 **(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.

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Answer(b) \$ ..... [2]

(a)(i) Interest, growth and decay (a)(ii) Interest, growth and decay (b) Interest, growth and decay

Click for more variations

10 **(a)** The value of Priya's car decreases by 10% every year.
The value today is \$7695.

(i) Calculate the value of the car after one year.

\$ ..... [2]

(ii) Calculate the value of the car one year ago.

\$ ..... [2]

(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]

(c) Sara invests \$500 at a rate of r% per year compound interest.
At the end of 12 years, the value of Sara's investment is \$601.35, correct to the nearest cent.

Find the value of r.

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$r =$ ..... [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]

(a)(i) Percentage increase and decrease (a)(ii) Reverse percentages (b) Interest, growth and decay
(c) Interest, growth and decay (d)(i) Percentage increase and decrease (d)(ii) Interest, growth and decay
Click for more variations
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