

MATHEMATICS

Stage 5

Number and Algebra, Equations

Quadratics and Cubics

Number and Algebra, Financial Mathematics

Compound Interest

Simple Interest

Depreciation

Earning and Spending Money

Number and Algebra, Linear Relationships

Cartesian Plane

Measurement and Space, Trigonometry

Right-Angled Trig

Teacher: Kyall Duncan

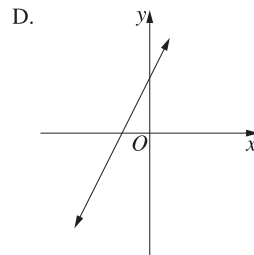
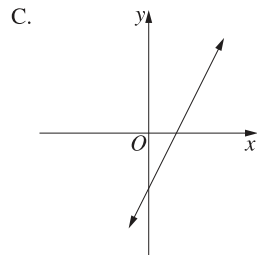
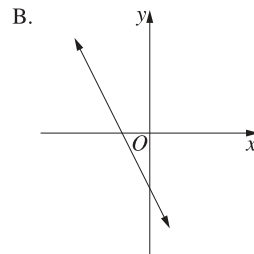
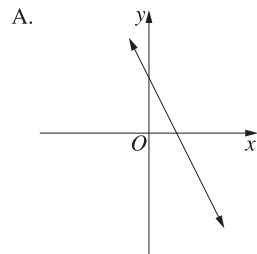
Exam Equivalent Time: 91.5 minutes (based on allocation ~1.25 min/mark)



Questions

1. **C** Cartesian Plane (196472)

Which of the following could be the graph of $y = -2x + 2$?



2. **C** Compound Interest (137253)

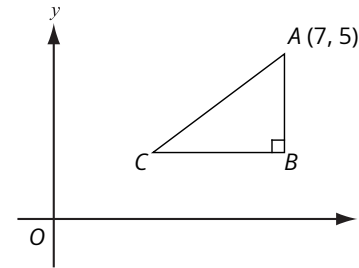
Chris opens a bank account and deposits \$1000 into it. Interest is paid at 3.5% per annum, compounding annually.

Assuming no further deposits or withdrawals are made, what will be the balance in the account at the end of two years?

- A. \$1070.00
- B. \$1071.23
- C. \$1822.50
- D. \$2070.00

3. **C** Cartesian Plane (228155)

The coordinates of point A are $(7, 5)$.



AB is parallel to the y -axis.

If $AB = 3$, $BC = 4$ and $AC = 5$, what are the coordinates of point C ?

- A. $(3, 2)$
- B. $(2, 3)$
- C. $(1, 5)$
- D. $(5, 1)$

4. **B** Quadratics and Cubics (097166)

Which expression is equal to $3x^2 - x - 2$?

- A. $(3x - 1)(x + 2)$
- B. $(3x + 1)(x - 2)$
- C. $(3x - 2)(x + 1)$
- D. $(3x + 2)(x - 1)$

5. **B** Simple Interest (253265)

Gutho invests \$10 000 for 1 year and 8 months. The simple interest is calculated at a rate of 4.25% per annum.

What is the total value of the investment at the end of this period, to the nearest dollar?

- A. \$10 425
 - B. \$10 571
 - C. \$10 708
 - D. \$14 562
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6. **B** Simple Interest (001958)

Lynne invests \$1000 for a term of 15 months. Simple interest is paid on the investment at a rate of 3.75% per annum.

How much will Lynne's investment be worth at the end of the term?

- A. \$1046.88
 - B. \$1047.09
 - C. \$1296.88
 - D. \$1468.75
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7. **B** Depreciation (254524)

A new air-conditioning unit was purchased for \$5000 on 1 January 2017.

On 1 January of each year after 2017 its value is depreciated by 20% using the reducing balance method.

The value of the air conditioner will be below \$1500 for the first time on 1 January

- A. 2020
 - B. 2021
 - C. 2022
 - D. 2023
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8. **B** Simple Interest (253284)

Albert borrowed \$2000 off his brother Sid so he could attend the rugby league Magic Round in Brisbane.

He did not make any monthly repayments but instead repaid the loan in full 12 months later with a lump sum of \$2350.

What was the annual simple interest rate Sid charged Albert?

- A. 3.5%
 - B. 17.5%
 - C. 23.5%
 - D. 35.0%
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9. **B** Simple Interest (253343)

A sum of money is invested in an account paying simple interest at a rate of 8% per annum.

The total interest earned on this investment over 6 years is \$27 000.

The sum of money invested is

- A. \$12 960
 - B. \$45 000
 - C. \$56 250
 - D. \$202 500
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10. **B** Depreciation (010131)

A car is bought for \$19 990. It will depreciate at 18% per annum.

Using the declining balance method, what will be the salvage value of the car after 3 years, to the nearest dollar?

- A. \$8968
 - B. \$9195
 - C. \$11 022
 - D. \$16 392
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11. **B+** Earning and Spending Money (015088)

Joe is about to go on holidays for four weeks. His weekly salary is \$280 and his holiday loading is 17.5% of four weeks pay.

What is Joe's total pay for the four weeks holiday?

- A. \$196
- B. \$329
- C. \$1169
- D. \$1316

12. **B+** Earning and Spending Money (014181)

Luke's normal rate of pay is \$15 per hour. Last week he was paid for 12 hours, at time-and-a-half.

How many hours would Luke need to work this week, at double time, to earn the same amount?

- A. 4
- B. 6
- C. 8
- D. 9

13. **A** Compound Interest (029229)

What amount must be invested now at 4% per annum, compounded quarterly, so that in five years it will have grown to \$60 000?

- A. \$8919
- B. \$11 156
- C. \$49 173
- D. \$49 316

14. **A** Simple Interest (137268)

What is the interest earned, in dollars, if \$800 is invested for x months at a simple interest rate of 3% per annum?

- A. $2x$
- B. $24x$
- C. $200x$
- D. $2400x$

15. **A** Earning and Spending Money (002647)

Jo qualifies for both Rent Assistance and Youth Allowance and receives a fortnightly payment from the government.

Rent Assistance is \$119.40 per fortnight.

The maximum Youth Allowance is \$402.70 per fortnight. It is reduced by 50 cents in the dollar for any income earned over \$236 per fortnight.

Jo earns \$300 per fortnight from a part-time job.

What is the total payment Jo receives each fortnight from the government?

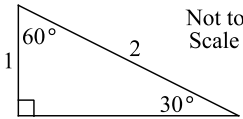
- A. \$370.70
- B. \$372.10
- C. \$458.60
- D. \$490.10

16. **A** Cartesian Plane (010503)

Which equation represents the line perpendicular to $2x - 3y = 8$, passing through the point $(2, 0)$?

- A. $3x + 2y = 4$
- B. $3x + 2y = 6$
- C. $3x - 2y = -4$
- D. $3x - 2y = 6$

17. **D** Right-Angled Trig (232468)



Using Pythagoras and showing your working, express $\cos 30^\circ$ as a fraction. (2 marks)

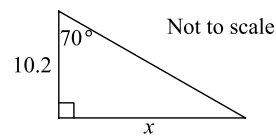
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18. **c** Right-Angled Trig (232647)



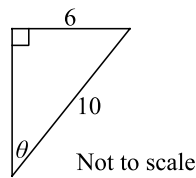
Find the value of x , correct to 1 decimal place. (2 marks)

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19. **c** Right-Angled Trig (232618)



i. Express the ratio of $\cos\theta$ in its simplest form. (2 marks)

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ii. Hence, find the value of θ , correct to two decimal places. (1 mark)

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20. **c** Cartesian Plane (228340)

Given $C(-3, -5)$ and $D(-5, 1)$, find the midpoint of CD . (2 marks)

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21. **c** Right-Angled Trig (245025)

Express the compass bearing $S30^\circ E$ as a true bearing. (2 marks)

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22. **c** Cartesian Plane (228485)

A straight line passes through points $Q(3, -2)$ and $R(-1, 4)$.

Find the equation of QR and express in general form. (3 marks)

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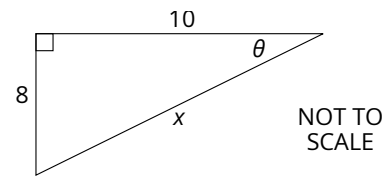
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23. **c** Right-Angled Trig (157388)

Consider the triangle shown.



a. Find the value of θ , correct to the nearest degree. (2 marks)

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b. Find the value of x , correct to one decimal place. (2 marks)

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24. **c** Compound Interest (225910)

What amount must be invested now at 3% per annum, compounded annually, so that in two years it will have grown to \$20 000? (2 marks)

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25. **c** Cartesian Plane (228425)

Calculate the distance between the points $(6, -5)$ and $(0, 3)$. (2 marks)

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26. **B** Right-Angled Trig (245577)

Boat A leaves port on a bearing of 065° and sails for 22 km until it is due east of Boat B.

If Boat B is due north of the port, find the distance between the port and Boat B in kilometres, correct to two decimal places. (3 marks)

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27. **B** Simple Interest (253309)

Carissa borrowed \$4000 to buy new surfboards.

She did not make any monthly repayments and repaid the loan in full 2 years later with a lump sum of \$4400.

Determine the annual simple interest rate that Carissa was charged. (2 marks)

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28. **B** Compound Interest (254448)

Michelle decided to invest some of her money at a higher interest rate. She deposited \$3000 in an account paying 8.2% per annum, compounding half yearly.

a. Write down an expression involving the compound interest formula that can be used to find the value of Michelle's \$3000 investment at the end of two years. Find this value correct to the nearest cent. *(2 marks)*

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b. How much interest will the \$3000 investment earn over a four-year period?
Write your answer correct to the nearest cent. *(2 marks)*

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29. **B+** Depreciation (225971)

Alan bought a light aircraft for \$76 500. It will depreciate at 14% per annum.
Using the declining balance method, what will be the salvage value of the light aircraft after 6 years, to the nearest dollar?

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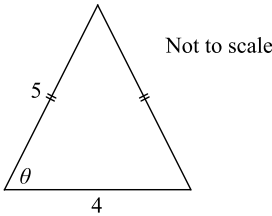
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30. **B+** Right-Angled Trig (232622)



Find the value of θ , correct to the nearest minute. *(3 marks)*

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31. **A** Cartesian Plane (228433)

Calculate the value(s) of p given that the points $(p, 3)$ and $(1, p)$ are exactly 10 units apart. *(3 marks)*

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32. **A** Compound Interest (177885)

Nina plans to invest \$35 000 for 1 year. She is offered two different investment options.

Option **A**: Interest is paid at 6% per annum compounded monthly.

Option **B**: Interest is paid at r % per annum simple interest.

a. Calculate the future value of Nina's investment after 1 year if she chooses Option **A**. *(2 marks)*

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b. Find the value of r in Option B that would give Nina the same future value after 1 year as for Option A.
Give your answer correct to two decimal places. *(2 marks)*

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33. **A+** Simple Interest (225668)

George makes a single deposit of \$9000 into an account that pays simple interest.

After 4 years, George's account has a balance of \$10 350.

What simple interest rate did George receive on his investment? *(2 marks)*

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