



<b>Task Number</b>	2	<b>Task Name</b>	Summary sheet and test
<b>Course</b>	Year 12 Standard 1 Mathematics	<b>Faculty</b>	Mathematics
<b>Teacher</b>	Mr Whitehall	<b>Head Teacher</b>	Ms Humphries
<b>Issue date</b>	Friday B 1/3/2024 Week 5 Period 2/3	<b>Due date</b>	Friday B 15/3/2024 Week 7 Period 2/3
<b>Focus (Topic)</b>	Rates (Chapter 2, 7, & 10) Types of Relationships (Chapter 3 & 6)	<b>Task Weighting</b>	20%

### Outcomes

**MS1-12-1** uses algebraic and graphical techniques to evaluate and construct arguments in a range of familiar and unfamiliar contexts

**MS1-12-10** uses mathematical argument and reasoning to evaluate conclusions, communicating a position clearly to others

**MS1-12-6** represents the relationships between changing quantities in algebraic and graphical forms

### Task description

This task contains two main components:

- Summary sheet (5%)
- Test from a published bank of questions (15%)

#### Summary sheet (5%)

- From the bank of questions that you receive you must create a **one-sided A4** summary sheet that can be brought into the test. This summary sheet can include notes, summaries from the textbook and worked examples. It must **NOT** have worked solutions for questions in the question bank. This summary will be handed in at the conclusion of the test.

#### Test from Published Bank of Questions (15%)

This task requires students to sit a test consisting of questions randomly selected from a published bank of questions. The bank of questions will be available to the students prior to the test and will be given to the students along with the assessment notification.

Topics include:

- Linear relationships
- Graphing curves
- Rates
- Similarity

Students will complete the test in class on Friday Week 7 Period 2. No technology other than NESAs approved calculators may be used.

## Marking Guidelines

GRADE	DESCRIPTION: the student
<p><b>OUTSTANDING</b></p> <p><b>O</b></p>	<p>Has an extensive knowledge and understanding of content            Has a very high level of competence in processes and skills            Can apply knowledge and skills to new situations</p> <ul style="list-style-type: none"> <li>• <i>Selects and uses efficient strategies to accurately solve unfamiliar multi-step problems</i></li> <li>• <i>Uses and interprets formal definitions and generalisations when explaining solutions</i></li> <li>• <i>Uses deductive reasoning in presenting clear and concise arguments</i></li> <li>• <i>Consistently uses appropriate subject specific language and notations in written, oral and/ or graphical form</i></li> <li>• <i>Synthesises subject specific techniques, results and ideas across an entire course</i></li> </ul>
<p><b>HIGH</b></p> <p><b>H</b></p>	<p>Has a thorough knowledge and understanding of content            Has a high level of competence in processes and skills            Can apply knowledge and skills in most situations</p> <ul style="list-style-type: none"> <li>• <i>Selects and uses appropriate strategies to solve familiar, and some unfamiliar, multi-step problems</i></li> <li>• <i>Uses appropriate subject specific language and notations in written, oral and/ or graphical form</i> <ul style="list-style-type: none"> <li>• <i>Uses formal definitions when explaining solutions</i></li> </ul> </li> <li>• <i>Uses appropriate subject specific arguments to reach and justify conclusions</i></li> <li>• <i>May require guidance to determine the most efficient methods</i></li> </ul>
<p><b>SOUND</b></p> <p><b>S</b></p>	<p>Has a sound knowledge and understanding of the main areas of content            Has an adequate level of competence in processes and skills</p> <ul style="list-style-type: none"> <li>• <i>Uses appropriate strategies to solve familiar multi-step problems</i></li> <li>• <i>Uses appropriate subject specific language, notations and diagrams</i></li> <li>• <i>Uses appropriate subject specific arguments to reach conclusions</i></li> <li>• <i>May use appropriate subject specific arguments to reach and justify conclusions</i></li> </ul>
<p><b>BASIC</b></p> <p><b>B</b></p>	<p>Has a basic knowledge and understanding of the main areas of content            Has a limited level of competence in processes and skills</p> <ul style="list-style-type: none"> <li>• <i>Uses standard procedures to solve simple familiar problems</i></li> <li>• <i>May select and use standard procedures to solve simple familiar problems</i> <ul style="list-style-type: none"> <li>• <i>May explain and verify simple cross topic relationships</i></li> <li>• <i>Communicates ideas using some subject specific language</i></li> <li>• <i>May identify the strengths/ weaknesses of a particular strategy</i></li> </ul> </li> </ul>
<p><b>LIMITED</b></p> <p><b>L</b></p>	<p>Has an elementary knowledge and understanding in few areas of content            Has a very limited level of competence in some processes and skills</p> <ul style="list-style-type: none"> <li>• <i>Uses <b>with guidance</b> standard procedures to solve simple familiar problems</i></li> </ul>

# Year 12 Standard 1 Mathematics - Assessment Task 2

## Question Bank

1

mark

A plumber charges a call-out fee of \$90 as well as \$2 per minute while working.

Suppose the plumber works for  $t$  hours.

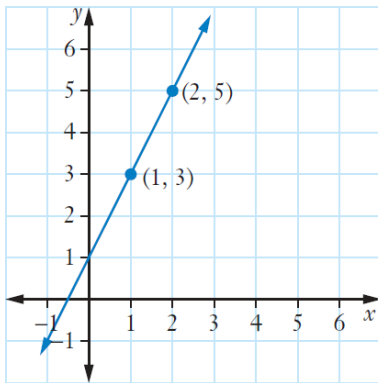
Which equation expresses the amount the plumber charges (\$ $C$ ) as a function of time ( $t$  hours)?

- A.  $C = 2 + 90t$
- B.  $C = 90 + 2t$
- C.  $C = 120 + 90t$
- D.  $C = 90 + 120t$

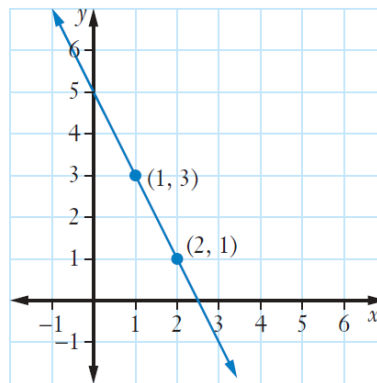
For each graph, find:

- i** the gradient
- ii** the  $y$ -intercept
- iii** the equation of the line.

**a**



**b**



6

marks

Adrian's Awesome Appetisers charges \$10 per person plus an \$80 fixed charge.

**a** Copy and complete this table.

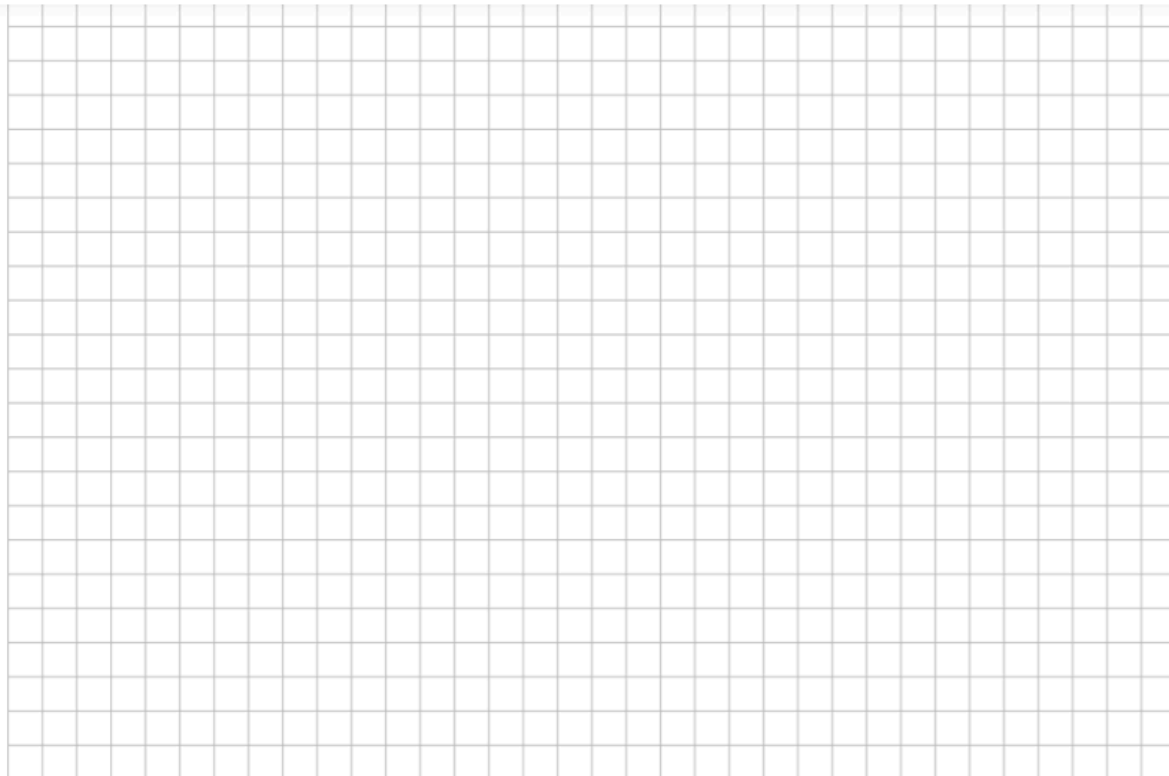
Number of people, $n$	0	50	100	150	200	250
Charge, \$ $C$	80					

**b** Construct a graph showing Adrian's charges for  $n$  people.

**c** Write a linear function to calculate the charge for  $n$  people.

**d** Use the function to calculate the cost for 170 people.

**e** Adrian charged NCM Properties \$830 for catering a party.  
How many people were catered for?



2  
Marks  
each  
part

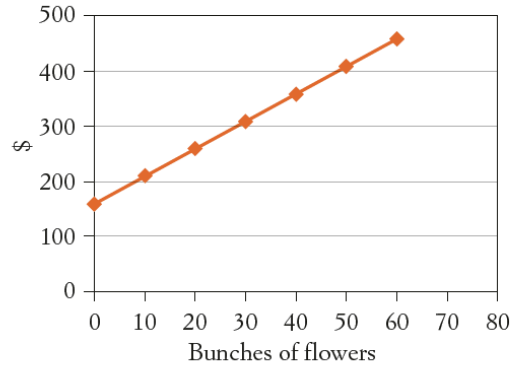
10  
marks  
total

**2** Allana sells flowers at the market and receives \$10 for each bunch sold.

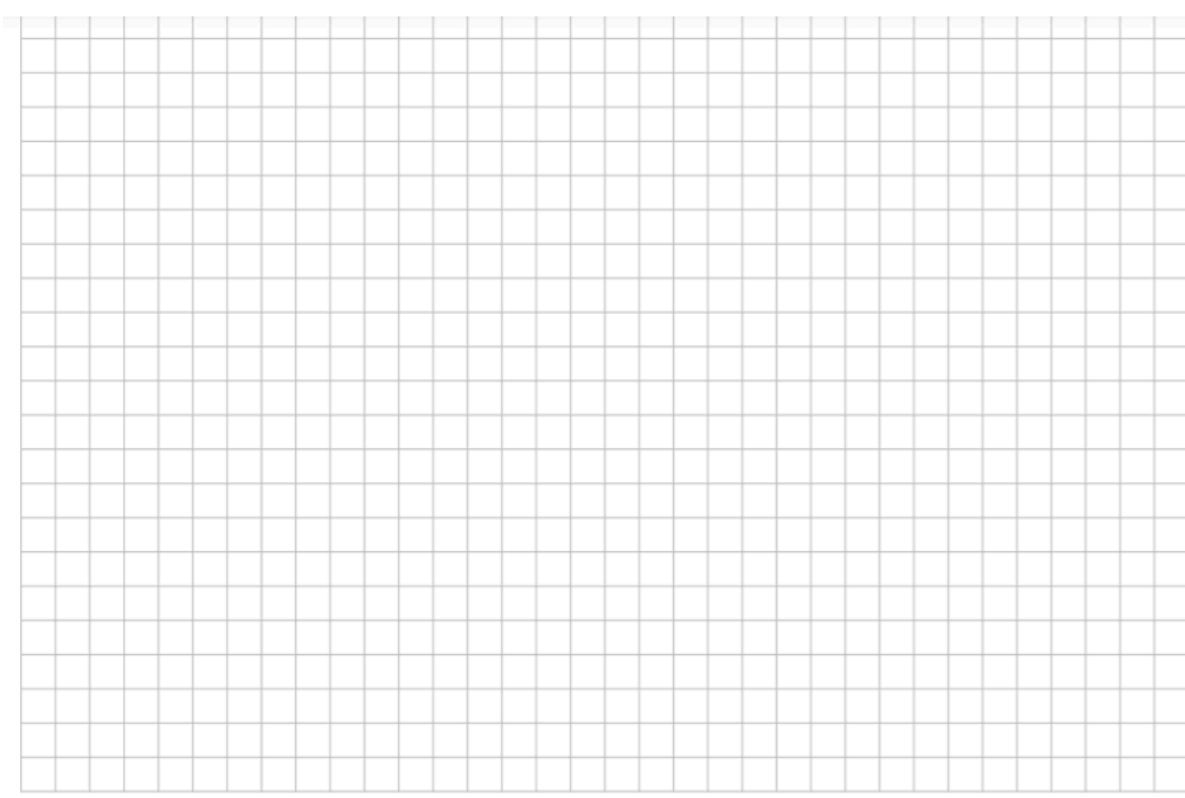
**a** Copy and complete this table.

Bunches of flowers sold	0	10	20	30	40	50	60
Income received (\$)							

**b** This graph shows Allana's costs when she sells  $n$  bunches of flowers.



Copy the graph and use your answers to part **a** to add the graph for Allana's income to it.



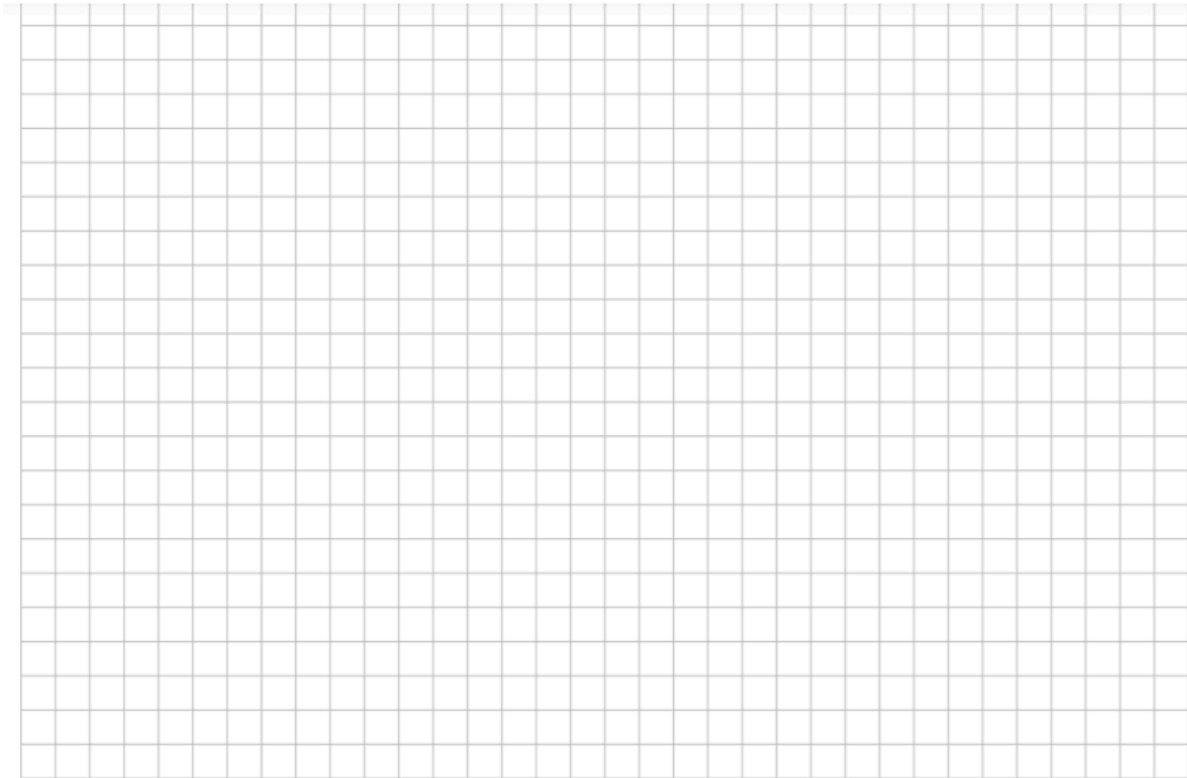
3  
Marks  
table  
  
3  
marks  
graph

A half-pipe is included in the new skate park at Nelsonville Village Park.  
This table gives the shape of the half-pipe.

<b>Distance from left-hand side (metres)</b>	0	1	2	3	4	5	6	7	8
<b>Height of pipe (metres)</b>	2.4	1.35	0.6	0.15	0	0.15	0.6	1.35	2.4

Graph the table of values and join the points with a smooth curve.

Don't forget to label each axis and give the graph a heading



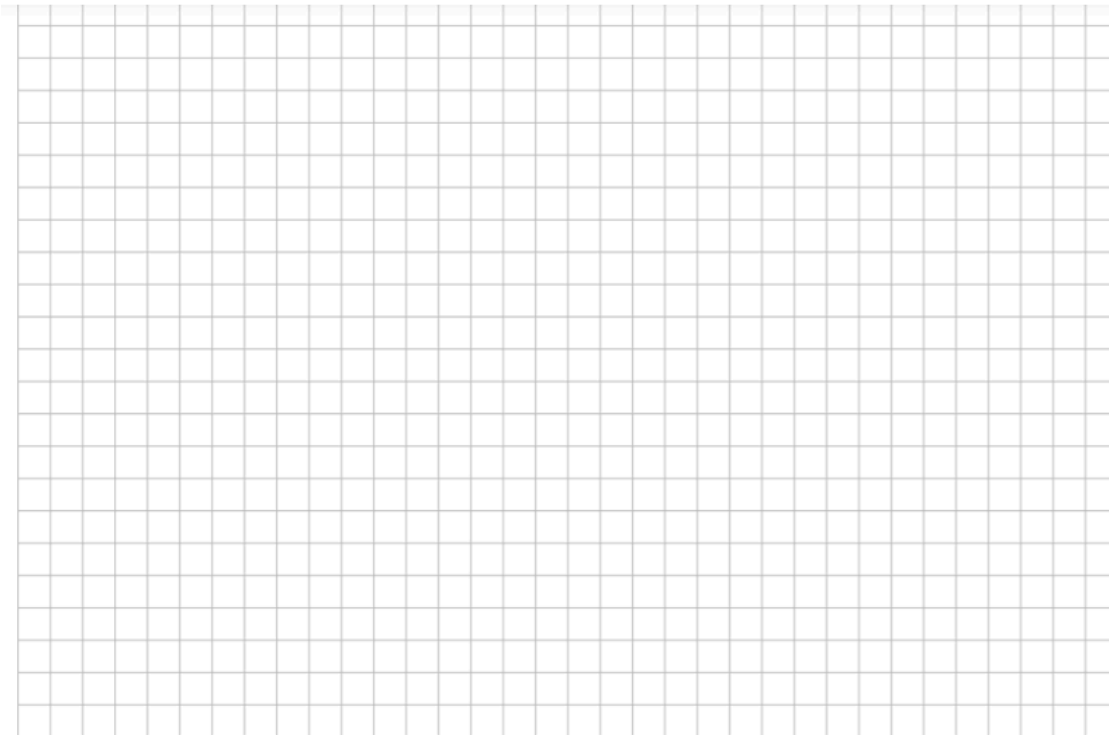
3  
Marks  
Plotting  
  
3  
marks  
labels

A new strain of the flu is spreading through the community and the number of people with the flu is increasing by 6% per day. At the moment, 40 people in the community are infected. The equation for calculating the number of infected people,  $I$ , after  $t$  days is given by  $I = 40 \times (1.06)^t$ .

- a** Copy and complete this table showing the increasing number of people with the flu over 10 days. Remember to round your answers to the nearest whole person!

Number of days ( $t$ )	0	1	2	3	4	5	6	7	8	9	10
Number of infected people ( $I$ )	40										72

- b** Draw the graph from this table of values.  
**c** Use your graph to estimate the time it will take to infect 55 people with the flu.



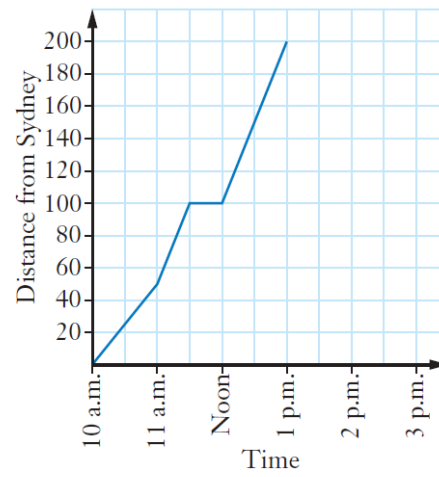
4  
Marks  
Table

4  
marks  
Graph

1  
Mark  
Part c

The incomplete graph below represents Hong's trip from Sydney to Goulburn and back.

- a** Describe the section of the journey shown on the graph.
- b** Hong stays in Goulburn for 2 hours and then returns to Sydney without stopping, arriving at 5 p.m. Copy the graph, extending the Time axis to 5 p.m., and complete the graph to show the return section of Hong's trip.



2  
Marks  
Part a

3  
Marks  
part b

A tradesman charged \$160 for  $2\frac{1}{2}$  hours work. Calculate this rate in dollars/hour.

2  
marks

John is preparing his budget for his holiday. For his 10-day holiday he is budgeting \$1200 for meals. Calculate John's meal budget in \$/day.

2  
marks



The distance between Bricktown and Koala Creek is 75km. A person travels from Bricktown to Koala Creek at an average speed of 50 km/h

1  
mark

How long does it take the person to complete the journey?

- A. 40 min
- B. 1 hour 25 min
- C. 1 hour 30 minutes
- D. 1 hour 50 minutes

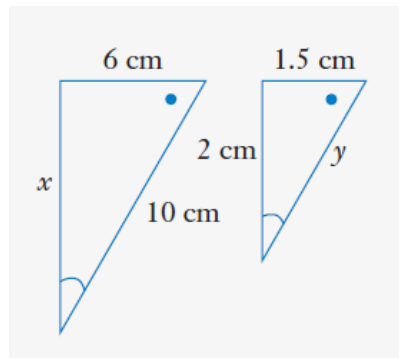
An ambulance is racing to the scene of a serious accident at a speed of 100 km/h.  
The accident is 15 km from the ambulance station.

3  
marks

- a** How long will the ambulance take to reach the accident? Express your answer as a decimal of an hour.
- b** Multiply your answer to part **a** by 60 to change the time to minutes.

For the following pair of similar figures:

- (i) Find the scale factor from the left figure to the right figure
- (ii) Find the value of each pronumeral

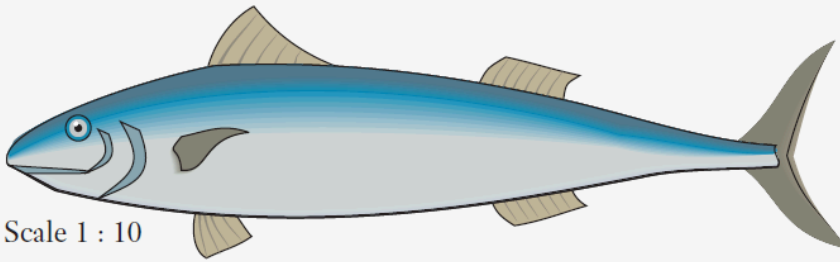


6  
marks

4  
marks

Measure the length of each scale drawing below, and then use the ratio to work out the actual length of the object shown.

**a** Fish



Scale 1 : 10

**b** Frog



Scale 1 : 4

Blood pressure is recorded as systolic pressure/diastolic pressure and measured in mmHg.

When standing upright, Mary's blood pressure was 139/85. Three minutes after sitting down, her blood pressure was 118/74.

What was the change in Mary's diastolic blood pressure?

- A. There was an increase of 11 mmHg.
- B. There was an increase of 21 mmHg.
- C. There was a decrease of 11 mmHg.
- D. There was a decrease of 21 mmHg.

1 mark



2  
marks

**Question 13** (2 marks)

The fuel consumption for a car is 6.7 litres/100 km. On a road trip, the car travels a distance of 1560 km and the fuel cost is \$1.45 per litre.

What is the total fuel cost for this trip?

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1  
Mark

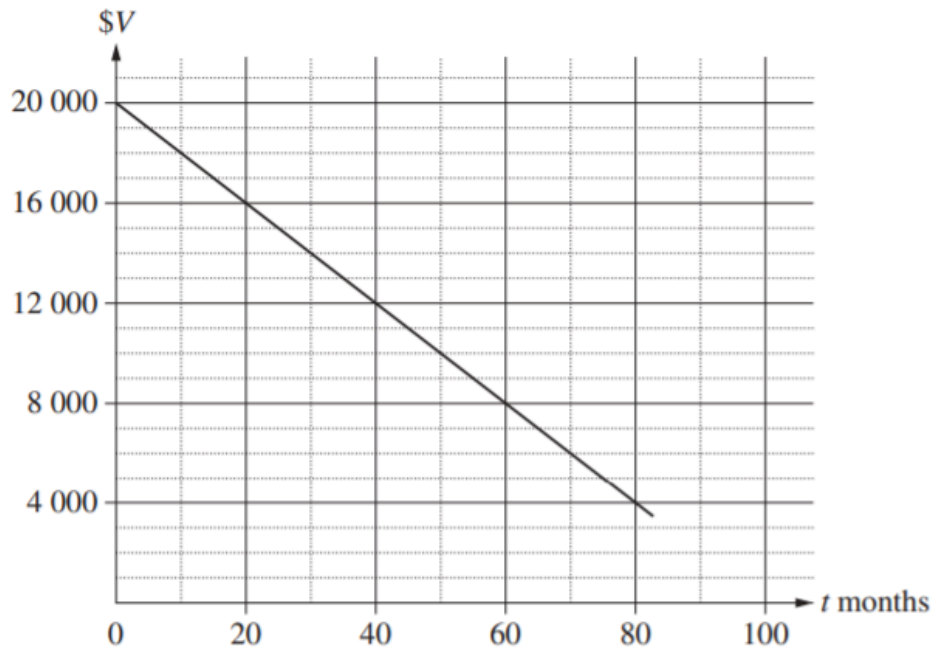
A student is thinking of a number. Let the number be  $x$ .

When the student subtracts 8 from this number and multiplies the result by 3, the answer is 2 more than  $x$ .

Which equation can be used to find  $x$ ?

- A.  $3(x - 8) = 2x$
- B.  $3x - 8 = 2x$
- C.  $3(x - 8) = x + 2$
- D.  $3x - 8 = x + 2$

Yin purchased a car for \$20 000. The value of the car decreases according to a linear model. The graph shows the value of the car, \$ $V$ , against the time,  $t$  months, since it was purchased.



- (a) By how much does the value of the car decrease every 10 months?  
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.....
  
- (b) Find the value of the car after 5 years.  
.....  
.....
  
- (c) Identify ONE problem with using this model to determine the value of Yin's car over time.  
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A tap is leaking water. It leaks 1 drop every 4 seconds, and 15 of these drops make up 1 mL.

(a) Find the amount of water leaked in a 24-hour period. Give the answer in litres.

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(b) A bucket can hold 9 litres of water.

How long will it take for the leaking tap to completely fill this empty bucket?

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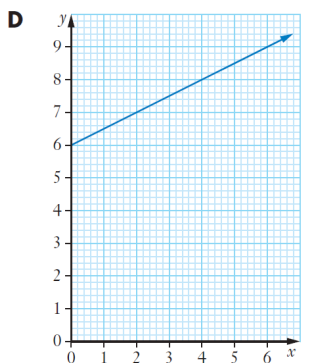
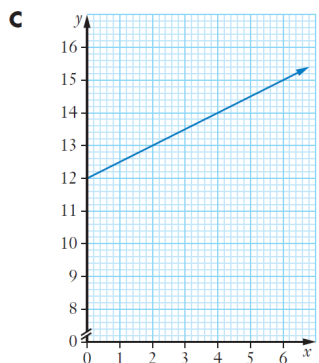
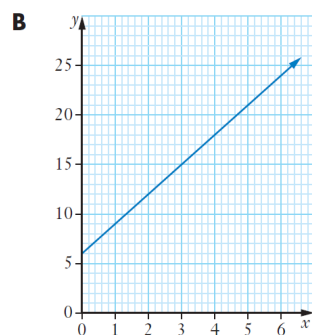
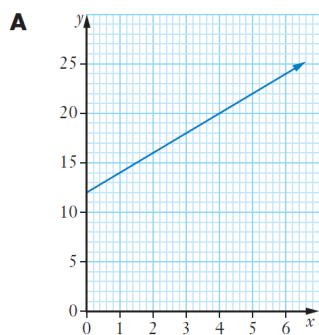
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Match each linear function to its correct graph. Use technology to check your answers.

- a**  $y = \frac{1}{2}x + 6$       **b**  $y = 3x + 6$       **c**  $y = \frac{1}{2}x + 12$       **d**  $y = 2x + 12$

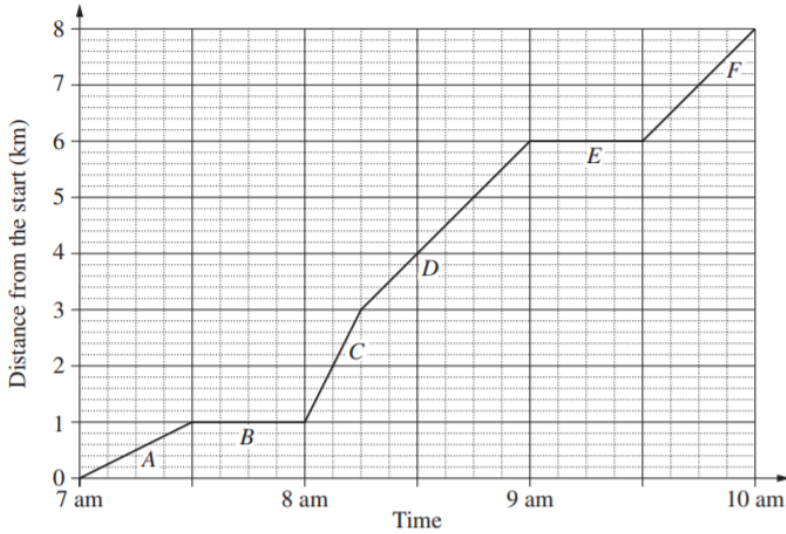


4  
marks

4  
marks

Sue walks along a trail, starting at 7 am and finishing at 10 am. The travel graph shows Sue's journey from the start to the finish. The journey has been broken into six sections, *A*, *B*, *C*, *D*, *E* and *F*.

6  
marks



- (a) On two occasions Sue stopped to rest. In which sections of the journey did Sue rest?

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 .....

- (b) In which section of the journey did Sue travel fastest? Justify your answer.

.....  
 .....

- (c) Kim walked along the same trail, also starting at 7 am and finishing at 10 am. Kim walked at a constant speed for the entire journey.

By showing Kim's journey on the grid above, determine between what times Sue was ahead of Kim.

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Olivia has been offered a new job. She has to choose her pay rate: \$36.50 per hour or a flat rate of \$1400 per week. In the job, Olivia will be working 40 hours per week. Which pay rate is the better deal?

3  
marks