6492MR: Assignment 3

Before doing this assignment you need to work through Chapters 7, 8 and 9 of your textbook:

New Century Maths 11 Mathematics Standard (Pathway 2)

By Klaas Bootsma, Sarah Hamper, Margaret Willard, Robert Yen

(see your OLS for more details)

What you need to do

- **Handwrite** the answers to the following questions **on your own paper**, showing all necessary working.

- There are 3 sections in this assignment:

    1. Linear Functions (SECTION A)

    2. Interest and Depreciation (SECTION B)

    3. Owning a Car (SECTION C)

- Attempt all questions in each section.

- Leave plenty of space around your answers for your teacher's comments and ways to improve your work.

- Take care drawing graphs. Use a ruler and sharp pencil for the greatest accuracy.

- If you have studied the work in your textbook, and you are stuck on an assignment question, you can contact us for help.

- It is important to present your work clearly and well to avoid having it returned to you unmarked as a non-serious attempt.
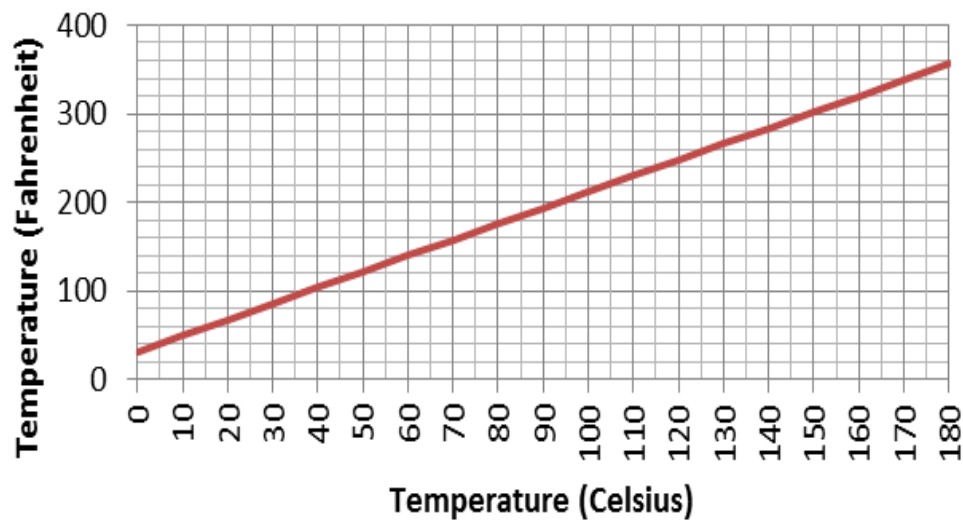
Section A: Linear Functions

1   What is the gradient of the straight line joining (6, 5) and (8, 6)?

2   Write the equation of the line with gradient 5 and y-intercept -4

3   The cost, C of filling a car with fuel is directly proportional to the number, N litres of fuel purchased.

      a) Write the variation equation relating C, N and the constant of variation, k

      b) If the cost of 32 litres of fuel is \$40 find the value of k.

      c) Find the cost of filling the car with 50 litres of fuel.

      d) What is the limitation of this linear model?

4   A manufacturer sells each article he produces for \$157, but out of this, he has to pay fixed costs of \$5000 per year.

      a) i) Copy and complete the table of values below showing the manufacturer's income I, corresponding to the production of N articles per year, for values of N from 0 to 150. (Note: Income, I = total sales minus fixed costs)

N	0	75	150
I			

        ii) Construct a graph (on the graph paper provided) showing the manufacturer's income, I, for values of N from 0 to 150.

      b) **Use your graph** to estimate the:

        i) income for a production of 90 articles per year

        ii) minimum number of articles that must be produced to cover fixed costs

        iii) number of articles that need to be produced to achieve an annual income of \$10 000

5 Lucy found an old recipe for a carrot cake, which needed to be cooked at 325°F.

She uses the fact that freezing point is 0°C or 32°F and that boiling point is 100°C or 212°F to draw the conversion graph below.

Celsius to Fahrenheit conversion

Use Lucy's graph to find what temperature in Celsius (°C) she should set her oven to cook the carrot cake using this recipe.
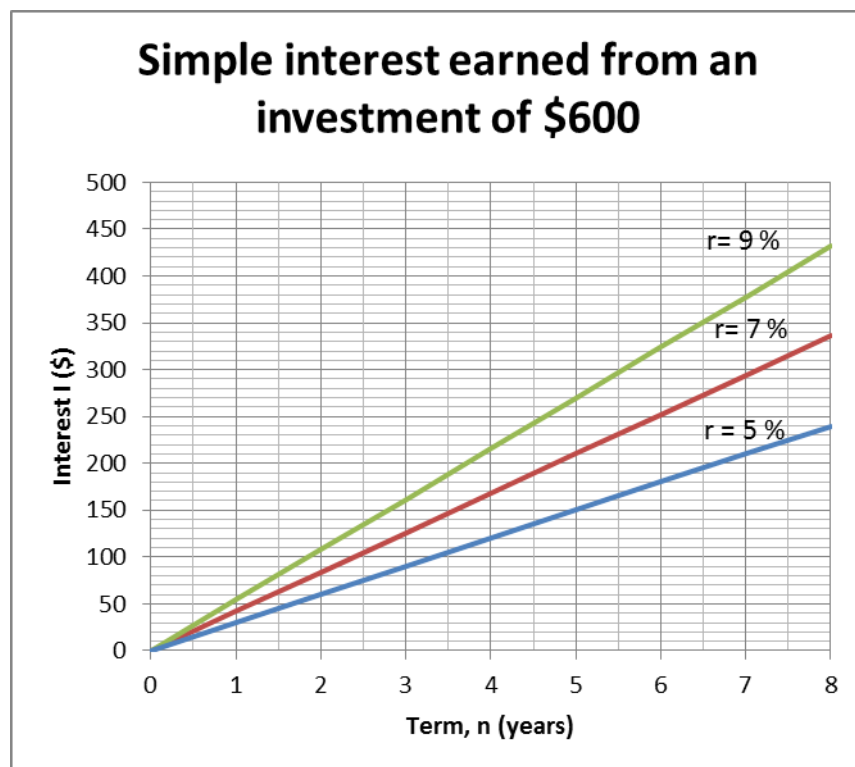
Section B: Interest and Depreciation

1   The local hardware store has a discount sale. Articles are offered for sale at 25% off the recommended retail price. Employees can also claim a further 10% price reduction on the sale price of all goods.

   During this sale an employee buys an article with a recommended retail price of $200.

   What price will the employee pay?

2   a)   Calculate the simple interest earned on an investment of $25 000 at 8.5% per annum for 2 years.

   b)   Audrey earned $1125 from an investment of $6000 over 5 years. What was the annual simple interest rate applied to this investment?
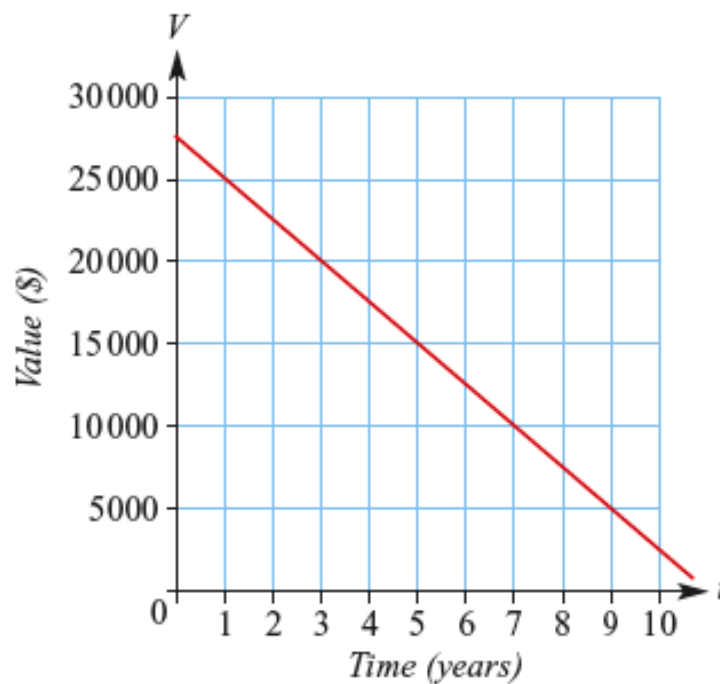
3   The graph below shows the simple interest earned on a principal of $600 for up to 8 years at three different annual interest rates.

Simple interest earned from an investment of $600

According to this graph, how long will it take a principal of $600 to earn $150 if the interest rate is 5% p.a.?

4   A tractor is purchased for $80 000 and depreciates by $5000 each year.

     a)   Use the straight-line depreciation method to find the value of the tractor after 5 years.

     b)   When will the tractor be worth half its purchase price?

5   The graph below shows the depreciation of a car over its useful life.

     a) How much was the car worth after 4 years?

     b) How much was the total depreciation in the first 4 years?

     c) How many years will it take to have a salvage value of $0?

Section C: Owning a Car

1   The table below gives the third party insurance premiums for the PRECAUTION insurance company.

Car make	Driver gender	Driver age	Town where vehicle is garaged	Place where car is kept	Third party property premium
Volkswagen	M	52	Lane Cove	garage	$310
Kia	F	34	Baulkham Hills	carport	$280
Toyota	F	29	Cronulla	on street	$320
Holden	M	19	Penrith	driveway	$332

Calculate the third party insurance premium for the Toyota driver above who gets a 12% no claim discount but then pays an 8% surcharge on the decreased premium because she parks on the street.

2   Stamp duty on private vehicles is calculated at the rate of 3% of the purchase price up to $45 000 plus 5% for every dollar over $45 000.

a) Copy and complete the table of values below showing purchase prices up to $50 000.

Vehicle Value ($)	0	15 000	30 000	45 000	50 000	60 000
Stamp Duty ($)						

b) Use your completed table to construct a graph on the graph paper provided at the end of this assignment.
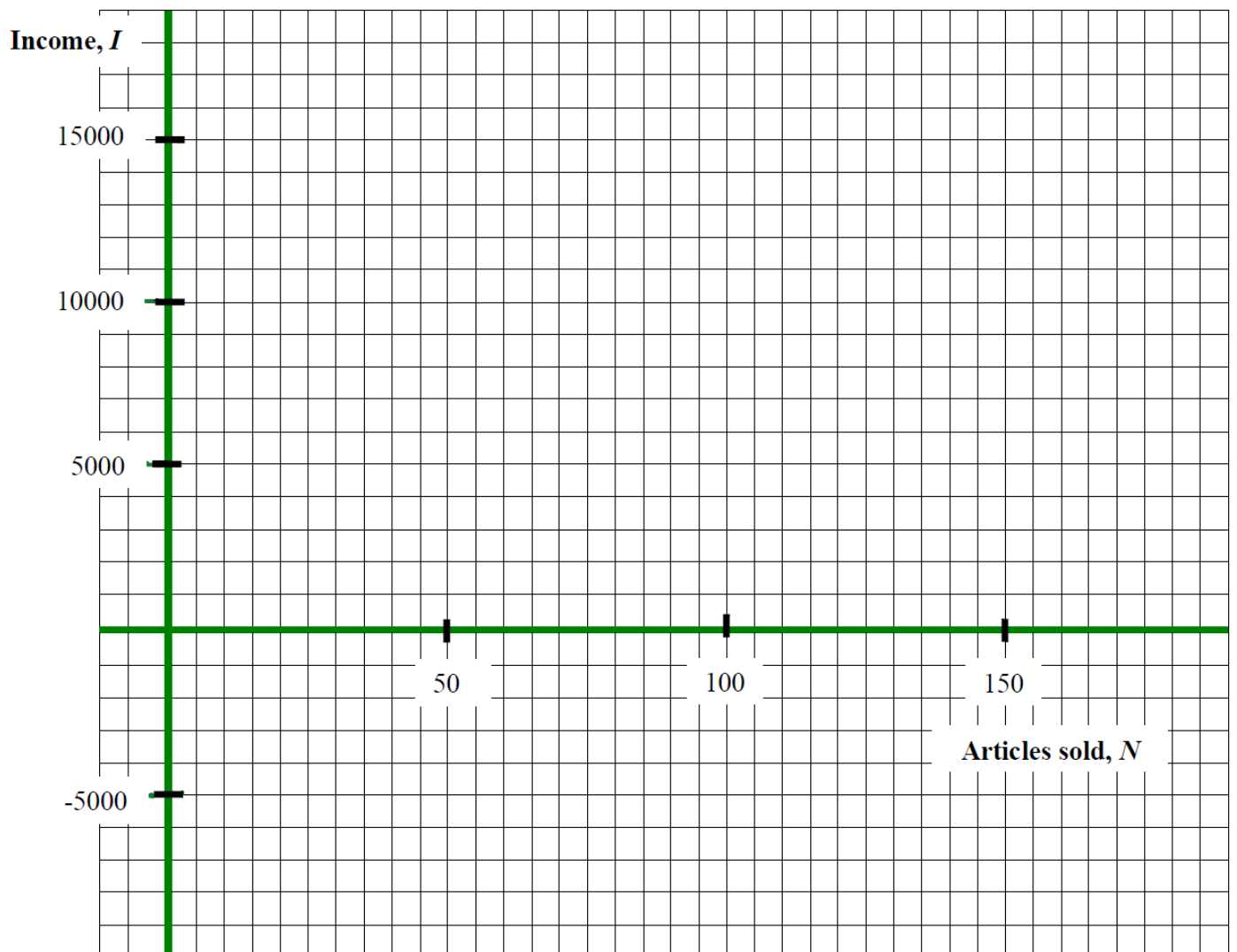
3   Nina is 28 years old. She purchased a $48 500 van from Cool Cars. She set up a table of extra costs associated with her purchase.

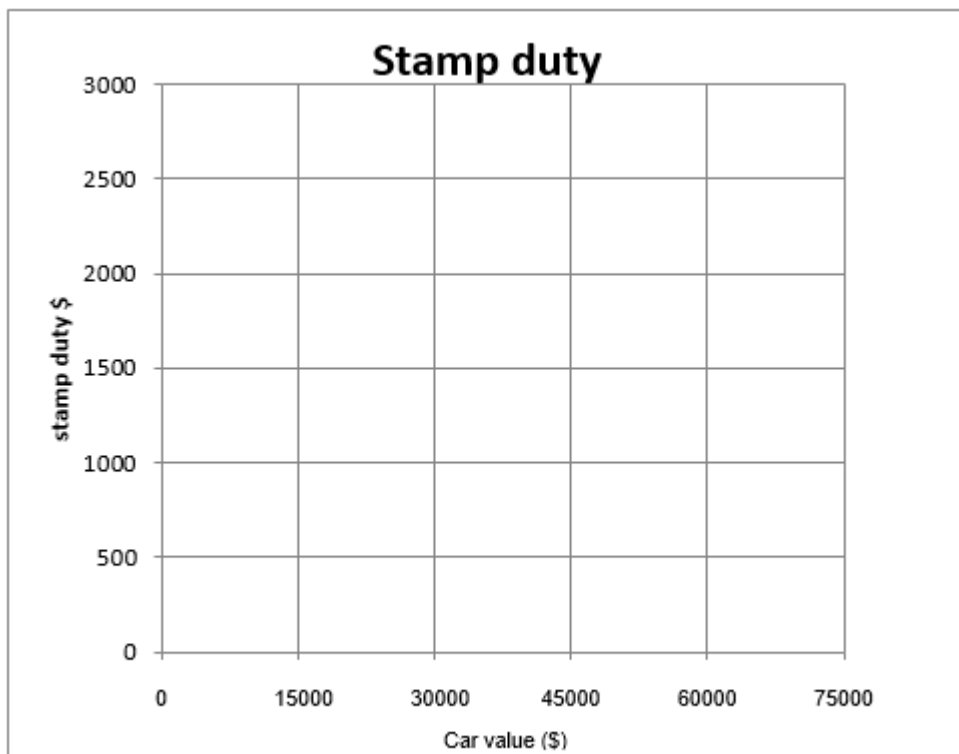| GST	10% of purchase price
Stamp duty (on GST price)	4% of the price inclusive of GST
Registration	$834 + transfer fee of $50
Green slip	$876
Comprehensive insurance	$1240

Find the total cost of purchasing this vehicle.

4   Michaela owns a Holden Commodore. Her car was serviced twice during the year, each service costing $350. She bought two new tyres at $151 per tyre and her weekly fuel bill was $40.
Parking fees and tolls amounted to $28 per week.

   a) How much did Michaela spend on her car during the year?

   b) What was the weekly cost of the car? Answer to the nearest dollar.

5   A Toyota Hilux Diesel has a fuel consumption of 9L/100 km, how much fuel will it use to travel 375 km?

6   Sam borrows $28 000 to buy a new car at a flat interest rate of 9% per annum over 3 years.

   How much will Sam need to budget per week to cover the cost of the loan repayments?

Checklist

I have:

- answered all questions on my own paper in my own hand-writing
- written clear working
- attempted all questions
- included all graphs.

If you are unable to complete this task for a specific reason, please contact your teacher to discuss alternative arrangements for demonstrating your skills and knowledge.