6493MS: Assignment 5

Before doing this assignment you need to work through Chapter 11 of your textbook:

New Century Maths Mathematics Standard 2 Year 12

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(see your OLS for more details)

What you have to do

Handwrite the answers to the following questions **on your own paper**, showing all necessary working. Do not write your answers on the question paper.

There are 2 sections in this assignment:

➢ The Normal Distribution (SECTION A)

➢ Revision (SECTION B)

Attempt all questions in each section.

Leave plenty of space around your answers for your teacher's comments and ways to improve your work.
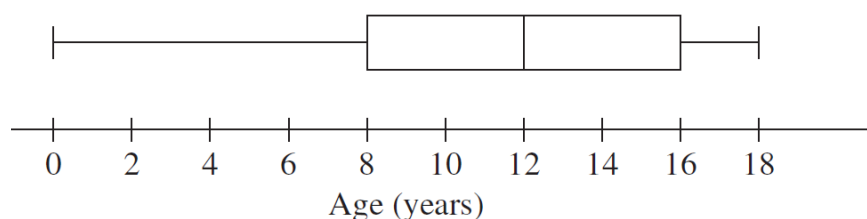
If you have studied the work in your textbook, and you are stuck on an assignment question, you can contact us for help.

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: The Normal Distribution

1. The box plot shows the distribution of the ages of children in a rural community.
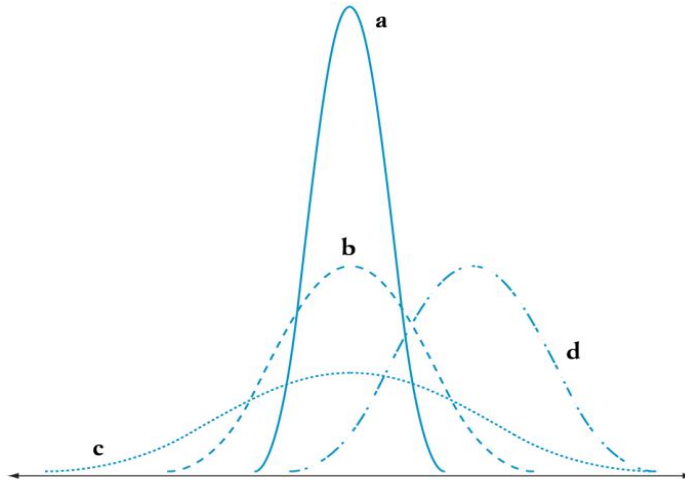

Age (years)

a) For the data shown determine:

i) the median age

ii) the interquartile range

b) Describe the skew of this data.

2. The back-to-back stem-and-leaf plot shows the number of cigarettes smoked before and after a quit smoking program.

Before		After
	0	3 7
0	1	
4 4 2 1	2	2 2 3 9
6 4 2 0	3	5 6 7 7
8 6 2	4	0 2

a) How many people took part in the program?

b) Find the median number of cigarettes smoked before and after the program.

c) Find the interquartile range of cigarettes smoked before and after the program.

d) Did the quit smoking program work for these people?

Use your answers to parts (b) and (c) to justify your answer.

3. Examine the normal curves below.

Which one of the following statements is true?

A   curves **b** and **d** have the same mean

B   curves **a**, **b** and **c** have the same mean

C   all curves have the same standard deviation

D   curve **c** has the smallest standard deviation

4. A Spanish test has a class mean of 84 and a standard deviation of 12.   An Italian test has a class mean of 74 and a standard deviation of 10.

a)   Veronica scored 78 in Spanish. What was her z-score?

b)   What was Veronica's raw score in Italian if she had a z-score of 0.1?

c)   Which was Veronica's best subject? Justify your answer.

5. Packets of rice are labelled as having a mass of 1 kg. The masses are normally distributed with mean 1.02 kg and standard deviation 0.01 kg.
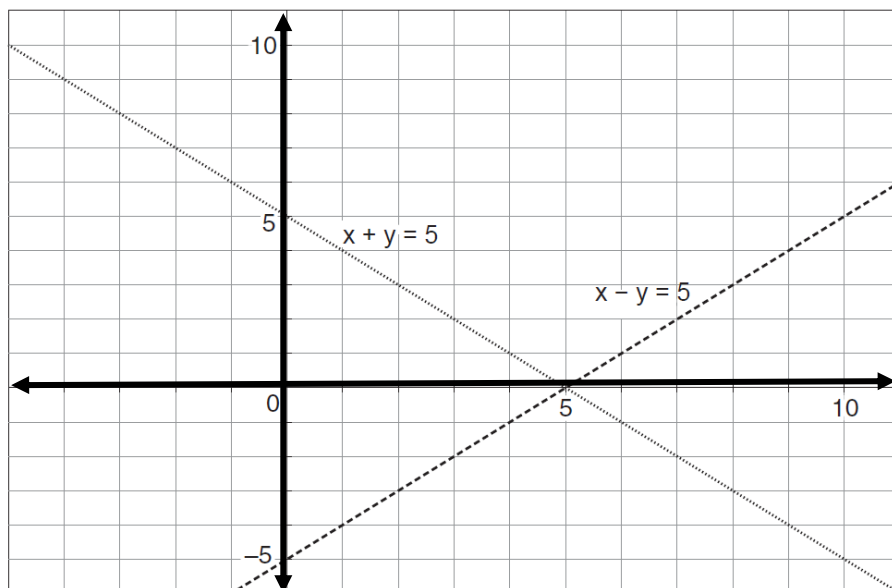
a) Copy and complete the table of values.

Mass (kg)	1.00	1.01	1.02	1.03	1.04
z-score			0	1	

b) What percentage of packets chosen at random will have a mass:

(i) more than 1.02 kg

(ii) between 1.00 kg and 1.04 kg

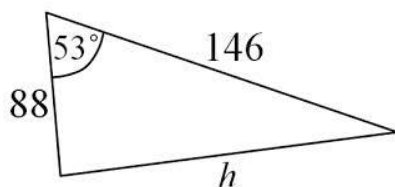(iii) between 1.00 kg and 1.02 kg

(iv) less than the labelled mass of 1 kg

Section B: Revision

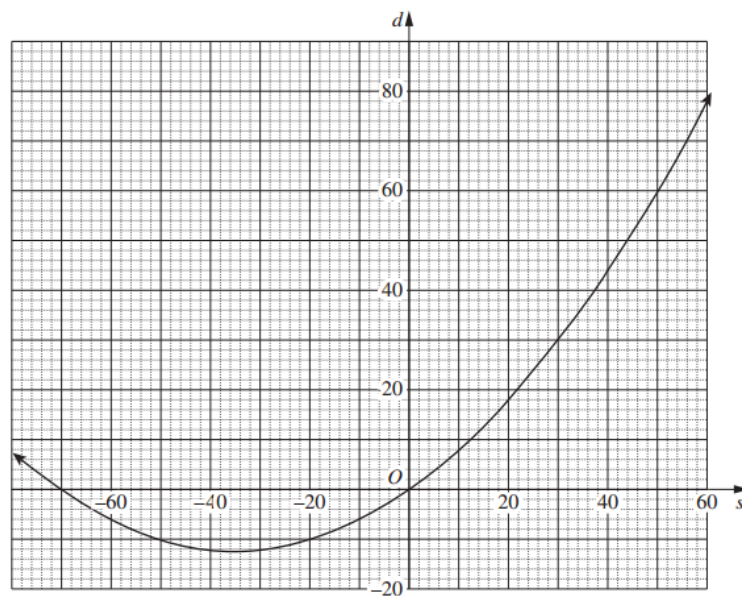**1** The lines $x + y = 5$ and $x - y = 5$ are shown below:

What is the solution when the equations are solved simultaneously?

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

3 Use the cosine rule to find the value of h in the following triangle.
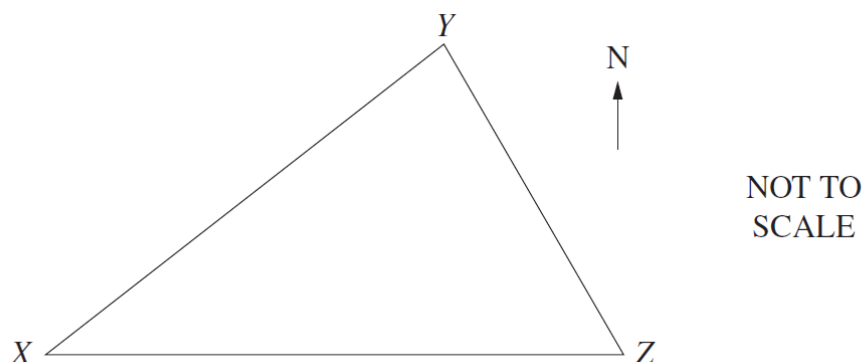
Answer to one decimal place.

NOT TO SCALE

4   Anjali is investigating stopping distances for a car travelling at different speeds. To model this she uses the equation $d = 0.01s^2 + 0.7s$, where d is the stopping distance in metres and s is the car's speed in km/h. The graph of this equation is drawn below.

a) Anjali knows that only part of this curve applies to her model for stopping distances. Using a set of axes, sketch the part of this curve that applies for stopping distances.

b) What is the difference between the stopping distances in a school zone when travelling at a speed of 40 km/h and when travelling at a speed of 60 km/h?

5   The diagram shows three towns X, Y and Z. Town Z is due east of Town X. The bearing of Town Y from Town X is N39°E and the bearing of Town Z from Town Y is S51°E. The distance between Town X and Town Y is 1330 km.
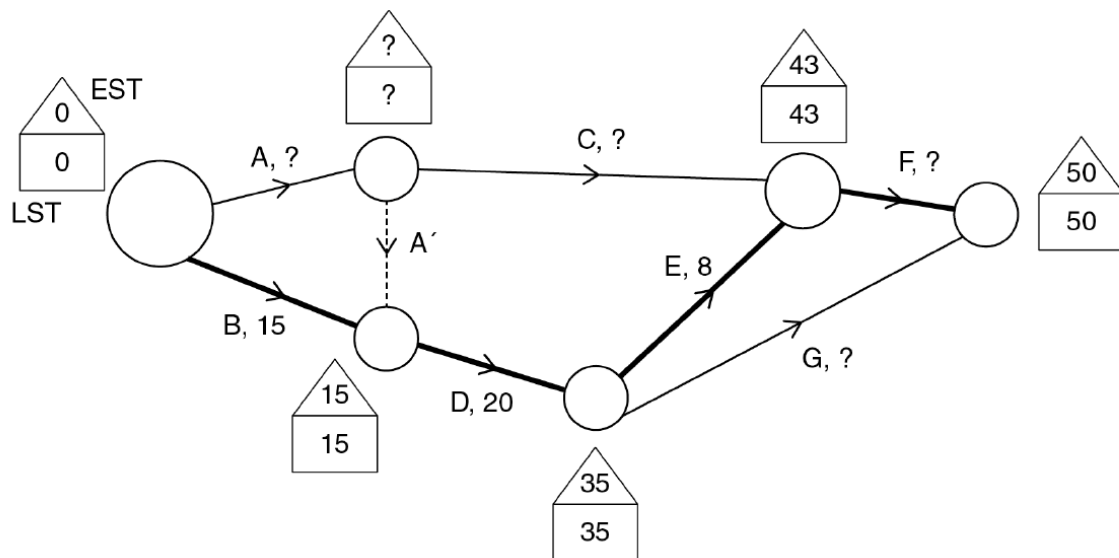

NOT TO SCALE

a) Copy the diagram and mark on it the given information and explain why angle XYZ is 90°.

b) A plane flies between from Town X to Town Y. If the speed of the plane is 570 km/h, how long does the flight take in hours and minutes?

c) Find the distance between Town X and Town Z to the nearest kilometre.

6   A project requires activities A to G to be completed, as shown in the table.

Activity	Immediate prerequisite(s)	Duration in days
A	–	?
B	–	15
C	A	?
D	A, B	20
E	D	8
F	C, E	?
G	D	?

The minimum completion time for the project is 50 days and the critical path includes activities B, D, E and F. The float for G is three days and the float for C is 8 days.

The network diagram of this project is shown on the next page:

a) i) Explain what is meant by the critical path BDEF.

ii) Find the duration of activity F.

b) Using the formula:

$$Float\ time = LST\ of\ next\ activity - EST\ of\ this\ activity - duration\ of\ this\ activity$$

determine the duration of activity G.

c) Find possible durations for activities A and C.

Checklist

I have:

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

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.