ASPLEY STATE HIGH SCHOOL
YEAR 11 MATHEMATICS A
ASSIGNMENT 1

SEMESTER 2, 2009 Time – 2 weeks
NAME: _____ DUE DATE: 28 October
TEACHER: _____

Knowledge and Procedures

/20

COMMUNICATION and JUSTIFICATION

Grade	Descriptor
A	The student consistently demonstrates: • Correct use of mathematical terms and symbols • Appropriate presentation of relevant information • Arguments which are logically developed to support a logical conclusion • Recognition of the effects of assumptions made • Justification of procedures
B	The student generally demonstrates: • Correct use of mathematical terms and symbols • Reasonable presentation of relevant information • Simple arguments are developed to support a conclusion • Justification of procedures
C	The student generally demonstrates: • Correct use of basic mathematical terms and symbols • Some simple arguments are developed to support arguments
D	The student sometimes demonstrates evidence of the use of basic conventions of language and mathematics
E	The student rarely demonstrates evidence of the use of basic conventions of language and mathematics

CAJ	

MODELLING and PROBLEM SOLVING

LEVEL	DESCRIPTOR
A	The response demonstrates mathematical thinking whereby the student has: • detailed evidence of having interpreted and analysed the problem and where required, identified variables; • selected and/or used effective strategies and procedures to make informed decisions to apply a correct method of solution and interpreted results (allowing for a minor mechanical error); • used initiative that may be required to explore the problem and recognised the strengths and limitations of the model.
B	The response demonstrates mathematical thinking whereby the student has: • detailed evidence of having interpreted and analysed the problem and where required, identified variables; • selected and/or used effective strategies and procedures to make informed decisions to apply a correct method of solution with minor omissions in process;
C	The response demonstrates mathematical thinking whereby the student has shown sufficient evidence of having analysed the problem and taken some steps to select an appropriate strategy or procedure to progress towards solving the problem.
D	The student approaches the problem with meaningful work indicating some understanding of the problem
E	Inappropriate strategies selected or non commencement.

	Q6	Q7
MAPS		

BUILDING A CARPORT

You intend building a carport.

Using the attached plan and specifications for the carport and the given site plan, complete the following:

KNOWLEDGE AND PROCEDURES

1. **Use the given specifications and Design Sheet** to work out the quantity of *each* timber size for the work in linear metres. Linear metres refer to the **length only** of the timber, irrespective of the cross-sectional dimensions. Note the posts are made of metal.

   4 marks

2. Using the information given in the Carport Design, the Specifications and the Rafter Stress Grade Selection table decide which stress grade of timber should be used for the rafters. You must give a clear explanation of how you made your choice.

   2½ marks

3. One Colorbond roofing sheet normally covers 760mm in width (after allowing for normal overlap). Investigate two ways of aligning the sheets and determine how many sheets will be required for the roof, how long will each sheet be and what is the total length in linear metres?
   Which is the cheapest option and how much is it?
   (ignore the fact that – in reality – they can only be fastened to the battens one way)

   4 marks

4. Find the cost of all materials required, including the concrete slab and Colorbond roofing. Allow $109 for the cost of nails, screws, bolts, stirrups and other hardware. DO NOT round individual item cents up or down to the nearest 5c BUT round your final total answer UP to the nearest ten dollars. 6 marks

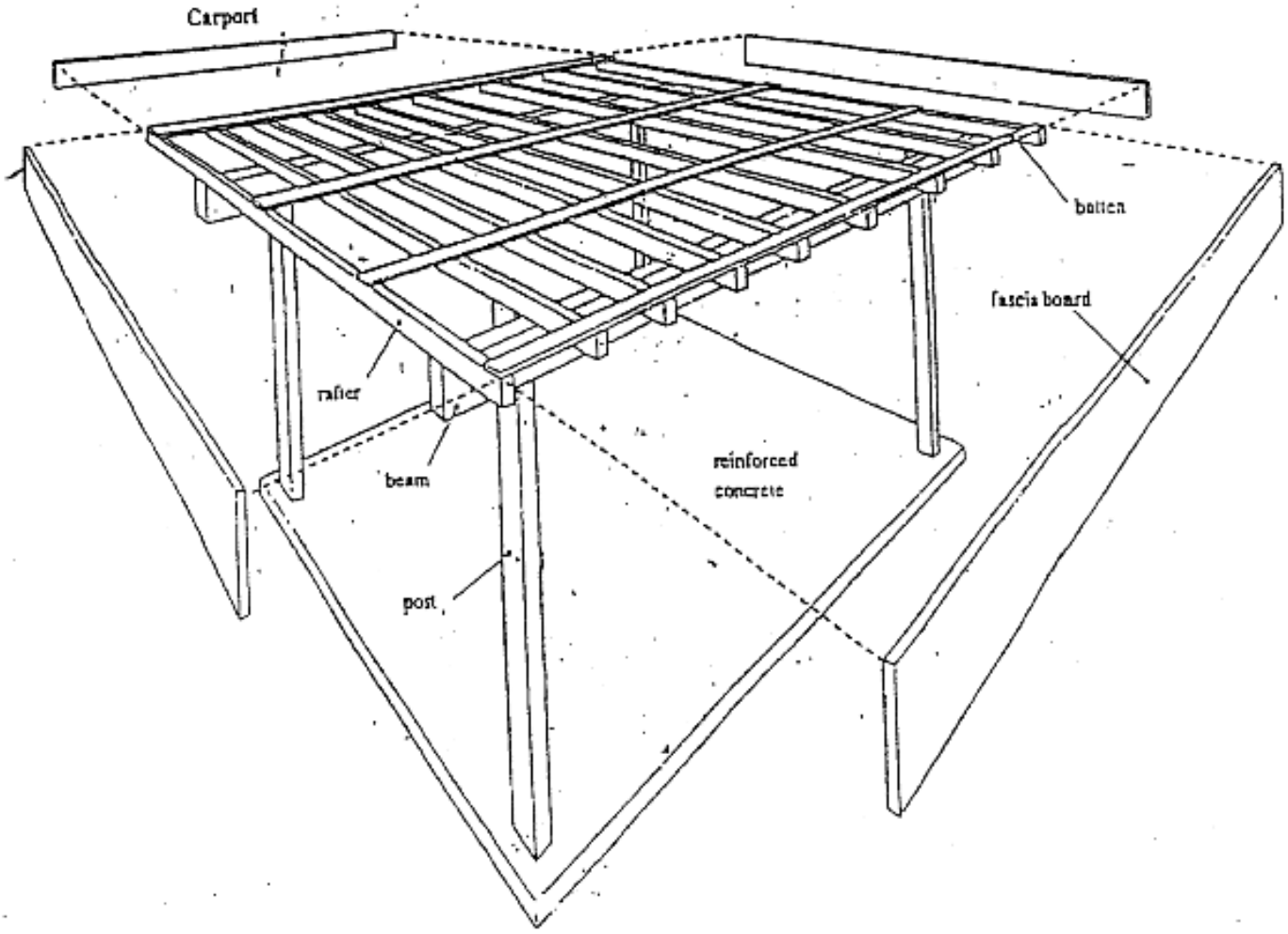
5. What order must the construction be carried out – support your decision with information you have found. 3½ marks

MODELLING AND PROBLEM SOLVING

6. Explain, in detail, how you would ensure that the roof of the carport is square.

7. A water tank is to be installed at the back of the carport to collect rain water. The tank has a diameter of 3.6 metres and is 3.2 metres high. Because of drought conditions, the tank becomes empty. Water costs $120 for 1500 litres or part thereof and the water tanker truck can carry 20 000 litres at a cost of $150 per load. How much will it cost to fill the tank by buying in water?

CARPORT DESIGN
(NOT TO SCALE)



SPECIFICATIONS

Reinforced concrete slab		6600 mm x 5400 mm x 100 mm			$130.00 per m^3
Posts		100 mm x 100 mm x 2400 mm			$ 4.94 per m
Beams		250 mm x 75 mm x 7200 mm			$ 3.03 per m
Rafters		150 mm x 50 mm x 6000 mm		*F 5	$ 3.03 per m
				F 5	$ 3.43 per m
				F14	$ 3.92 per m
Battens		38 mm x 25 mm x 7200 mm			$ 1.51 per m
Fascia boards (dressed)	2 @	240 mm x 19 mm x 7200 mm			$ 4.56 per m
	2 @	240 mm x 19 mm x 6000 mm			$ 4.56 per m
Colorbond roofing to be screwed to battens					$ 3.63 per m

RAFTER STRESS GRADE SELECTION TABLE

		Rafter Span (m)			Rafter Size (mm)	
Stress grade	Rafter Spacing (mm)	4.2	4.8	5.4	6.0	6.6
*F 5	600	100 x 38	125 x 38	125 x 50	150 x 38	175 x 50
	900	100 x 50	125 x 38	125 x 50	150 x 50	175 x 50
	1200	100 x 50	125 x 38	150 x 38	175 x 50	200 x 50
F 5	600	90 x 45	120 x 35	120 x 45	140 x 45	170 x 35
	900	90 x 45	120 x 35	120 x 45	140 x 45	170 x 45
	1200	120 x 35	120 x 45	120 x 45	170 x 35	170 x 45
F14	600	100 x 38	100 x 38	125 x 38	125 x 50	150 x 50
	900	100 x 38	100 x 50	125 x 38	150 x 38	175 x 50
	1200	100 x 38	100 x 50	125 x 38	150 x 38	175 x 50