

Carlingford High School

2019

Year 10 5.2 Term 3 Exam

Time allowed 50 min



Name.....

Teacher: *(Please Circle)*

Mr Cheng
Ms Aung

Mr Wilson
Mrs Lego

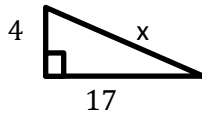
General Instructions

- Do not write in columns
- Marks may be deducted for careless or badly arranged work
- Only calculators approved by the Board of Studies may be used
- All answers are to be completed in black pen except graphs and diagrams
- No lending or borrowing

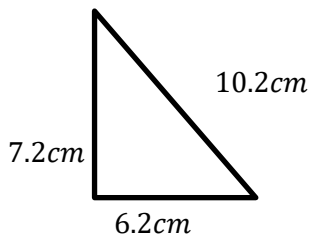
Q1 Trig	Q2 Binomial	Q3 Probability	Total
/25	/14	/29	/68

Trig (25 marks)

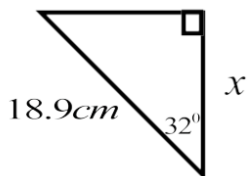
1. Find the value of the pronumeral, correct to one decimal place.



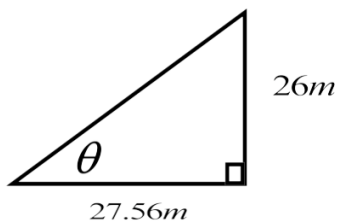
2. Test whether the triangle is right-angled.



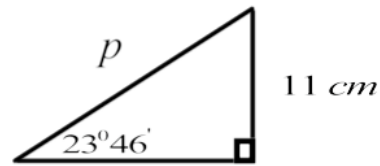
3. Find the value of the pronumeral, correct to two decimal places.



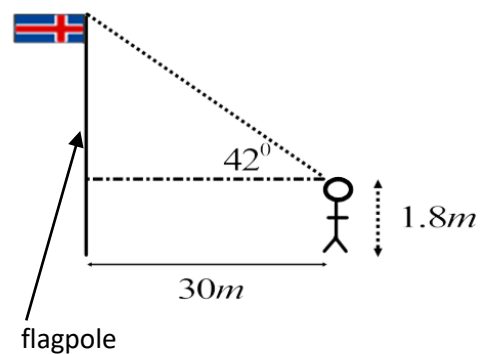
4. Find the value of θ . Give your answer to the nearest degree.



5. Find the value of the pronumeral. Give your answer to 1 decimal place.



6. Find the height of the flagpole.



7. A ship 1336 m out at sea observes a lighthouse on the top of a cliff at an angle of elevation of 3° .

i) Draw a labelled diagram with this information. (1)

ii) How high is the cliff (to the nearest metre)? (2)

8. Two people start walking from the same point. The first walks due east for 3.5 km and the second walks in the direction 123° until the second person is due south of the first person.

i) Draw a diagram with the above information. (1)

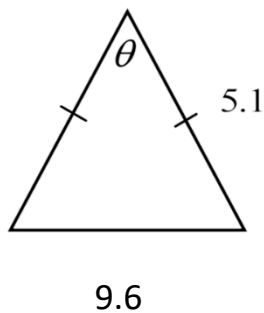
ii) How far did the second person walk (to the nearest metre)? (2)

9. If $\tan\theta = \frac{20}{21}$, find values for (3)

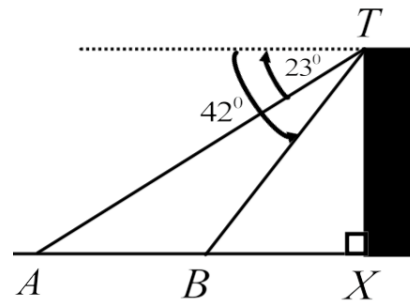
$$\sin\theta$$

$$\cos\theta$$

10. Find the value of θ . Give your answer to the nearest degree. (2)



11. From the top, T, of a 135-metre cliff, the angles of depression of two cabins at A and B are 23° and 42° respectively. How far apart are A and B, assuming that A, B and X, the foot of the cliff, are collinear? (3)
(answer to the nearest metre)



Binomial Expressions (14 marks)

12. Expand and simplify each binomial product.

i) $(x + 6)(x - 4)$

(1)

ii) $(3b + 4)(2b - 1)$

(2)

iii) $(2 - 5a)(5a - 2)$

(2)

13. Factorise each quadratic expression.

(3)

i) $x^2 + 9x + 18$

ii) $d^2 - d - 56$

iii) $a^2 - 12a + 27$

14. A room needs to be decreased in size. The room is currently a metres long and b metres wide. The length is to be reduced by 4 metres and the width by 2 metres.

i) Write expressions for the new length and width. (2)

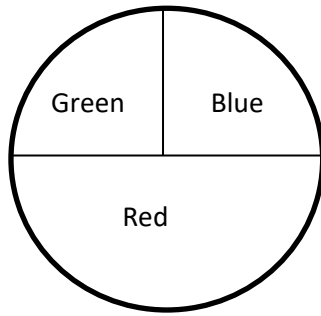
ii) Write a binomial expression for the new area of the room. (1)

iii) Expand and simplify your expression for the area. (1)

iv) By how much has the area of the room decreased? (2)

Probability (29 marks)

15.



Outcome	Frequency
Red	35
Blue	14
Green	11

The spinner above was spun 60 times and the results are shown in the table.

Calculate, as a fraction:

i) the experimental probability that the arrow stops on red. (1)

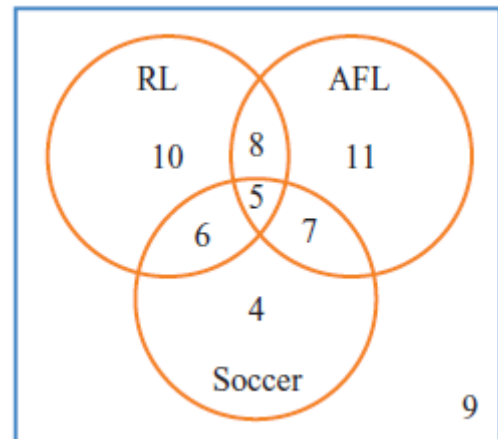
ii) the theoretical probability that the arrow stops on red. (1)

16. Is each pair of events dependent or independent?

i) How hard a person works and that person's performance at school. (1)

ii) The number rolled on a dice and the card drawn from a pack. (1)

17. The Venn diagram represents the results of a survey of which sports people liked to watch.



i) How many students were surveyed (1)

Calculate the probability, as a fraction, that a person chosen at random from this group:

ii) does not like rugby league (1)

iii) likes soccer and AFL but not rugby league (1)

iv) does not like any of these sports (1)

v) likes all three sports (1)

18.

	Heavy	Light	
Tall	8	9	17
Short	3	10	13
	11	19	30

The information in the table was collected from a group of athletes. Calculate the probability that an athlete chosen at random from this group is:

i) short (1)

ii) tall and light (1)

iii) tall or light but not both (1)

iv) neither short nor heavy (1)

19. Two coins are tossed.

i) Draw a table showing all possible outcomes. (2)

What is the probability of getting:

ii) 2 tails? (1)

iii) a tail and a head, in any order? (1)

iv) at least one tail? (1)

20. A bag contains 4 green marbles and 3 blue marbles. Two marbles are drawn at random from the bag without replacement. What is the probability that the second marble is green, given the first marble was also green? (1)

21. A bag contains 2 blue counters, 1 red counter and 1 white counter. Two counters are chosen at random one after the other from the bag.

i) Draw a **tree diagram** to find the **sample space** if the first counter **is replaced** before the second counter is selected. (2)

Find the probability of getting:

ii) 2 blue counters (1)

iii) a blue and red counter, in that order (1)

iv) red and white counters, in any order (1)

v) counters of different colours (1)

22. Omar has four cards labelled 0, 1, 2 and 3. He chooses two cards at random and places them on his desk forming a 2-digit number.

Calculate the probability that the number formed is:

i) 21. (1)

ii) a two digit number (one that doesn't begin with 0). (1)

iii) greater than 21. (1)

iv) divisible by 3. (1)