Section A: Algebra **(30 marks)**

1. Simplify

(a) $3 - 2a + 1 + 5a$ [1]

(b) $2x \times 3xy$ [1]

(c) $\frac{16x^4}{2x}$ [1]

2. Expand and Simplify

(a) $3(x + 4) + 2(8 - x)$ [2]

(b) $(x + 3)^2$ [2]

3. Factorise

(a) $2a^2b - ab$ [1]

(b) $x^2 - 7x + 12$ [1]

(c) $x^2 - 1$ [1]

4. Solve

(a) $7x = 84$ [1]

(b) $\frac{2y}{3} = 6$ [1]

(c) $4x - 5 = 17$ [1]

(d) $3(2 - x) = 9$ [2]

(e) $3x + 5 = 2(x + 1)$ [2]

(f) $(x + 1)(x - 4) = 0$ [1]

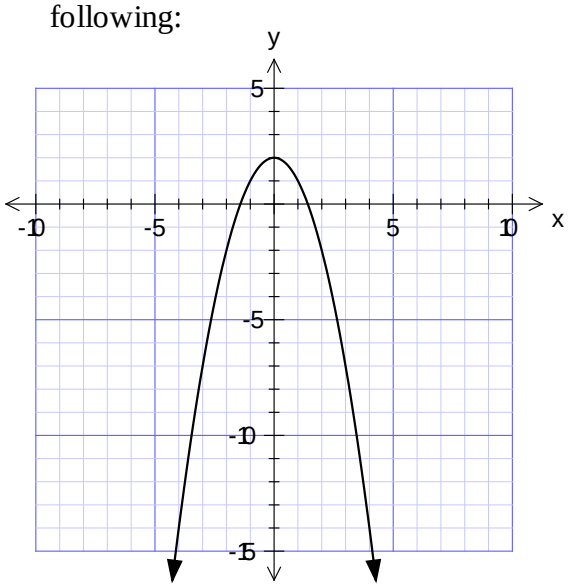
(g) $x^2 - x - 6 = 0$ [2]

5. Use the rule $y = (x + 1)(x + 2)$ to find the missing values of ***A*** and ***B***.

x	**y**
1	6
2	12
3	***A***
--	--
B	90

[2]

6. For the curve drawn below, state the following:



(a) the y-intercept [1]

(b) the equation of the curve (from the following options):

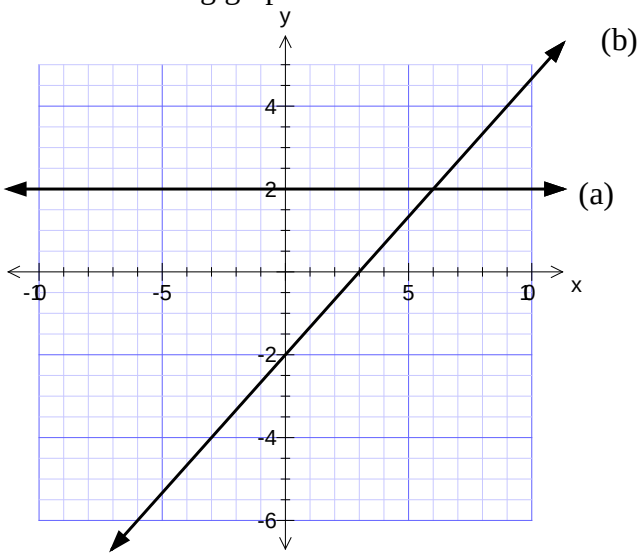
a. $y = x^2$
b. $y = (x - 2)^2$
c. $y = 2 - x^2$
d. $y = x^2 - 2$ [1]

7. Write a rule for **y** in terms of **x**.

x	**y**
1	1
2	4
3	7
4	10

[2]

8. Write down the equation for each of the following graphs



[2]

(c) On the grid on the answer sheet provided (attached to the back of this examination), draw the graph of: $y = 2x + 3$ [2]

Section B: Number (20 marks)

9. Round the following numbers to the accuracy required:

(a) 3259 (2 sig.figs.) [1]

(b) 0.0036215 (4 sig.figs.) [1]

10. Use a calculator to evaluate the following: (rounding to 2dp if needed)

a) $2.1 + 3.6 \times 4$ b) $2 + \sqrt{3.9 + 8.3}$

c) 2.6×3^4 d) $\frac{52-(2+4)^2}{3+7}$

e) $\sqrt[4]{2401}$ [5]

11. Divide 231 into the ratio 7:4 [2]

12. Reduce 136kg by 25% [1]

13. Calculate $1\frac{1}{6} \times 2\frac{4}{5}$ [1]

14. Write 28% as a fraction in its simplest form [1]

15. Write $\frac{8}{25}$ as a decimal. [1]

16. What is $\frac{2}{7}$ of 126 [1]

17. Write the following in standard form:

(a) 3610.3 [1]

(b) 0.001234 [1]

18. If a smartphone costs \$290 including GST of 15%, find its cost excluding GST. [2]

19. 40 members of Arwick Youth Club go on a trip to a leisure centre.They go in minibuses that can each seat up to 15 people. It costs \$30 for each minibus and \$150 for the group to have use of the leisure centre.

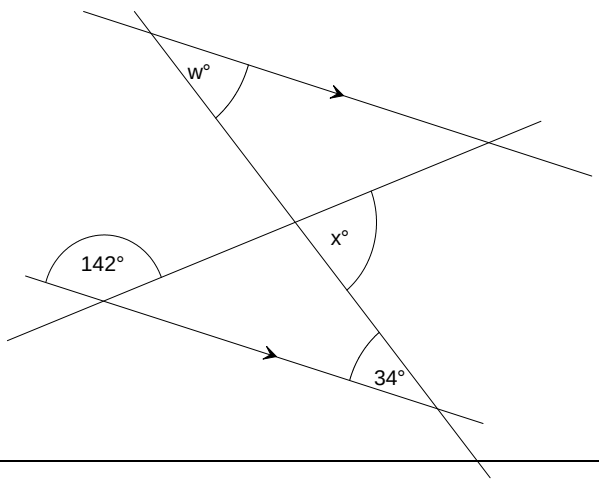
How much will the trip cost per person? [2]

Section C: Geometry & Trigonometry (25 marks)

Note the diagrams in this section are not drawn to scale.

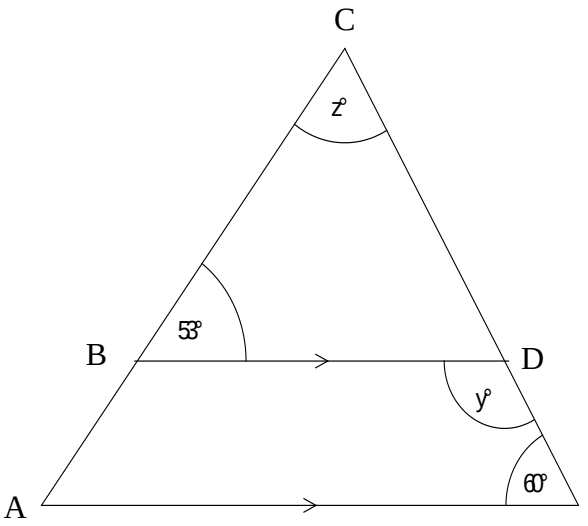
20.

(a) Find the value of the angles marked w and x.



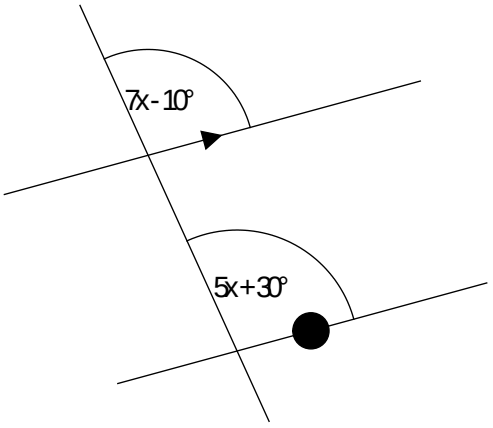
[2]

(b) Find the value of the angles marked y and z. **Give geometric reasons.**



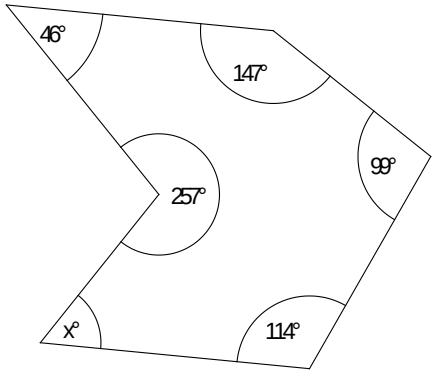
[2]

21. Form and solve an equation to find the value of x. State any geometrical reasons you use.



[2]

22. Calculate the size of the angle marked x.

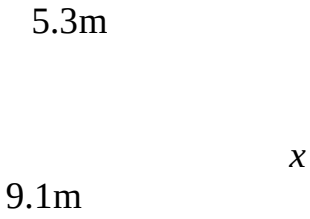


[2]

23. What is the size of **each** interior angle in a **regular** pentagon? [2]

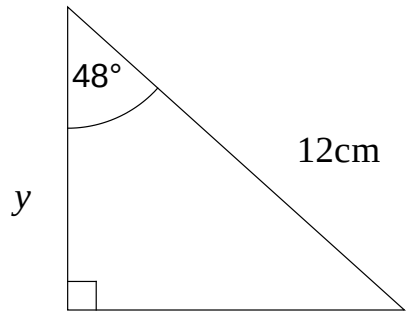
24. Calculate the unknown lengths

(a)



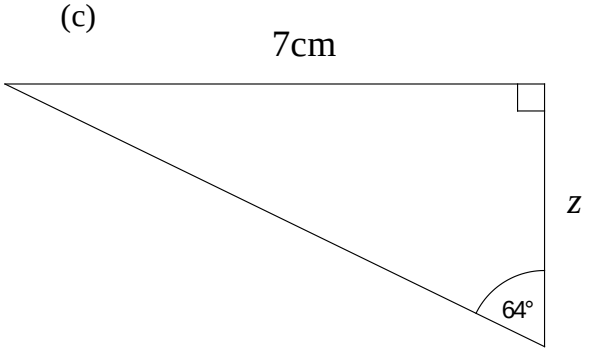
[2]

(b)



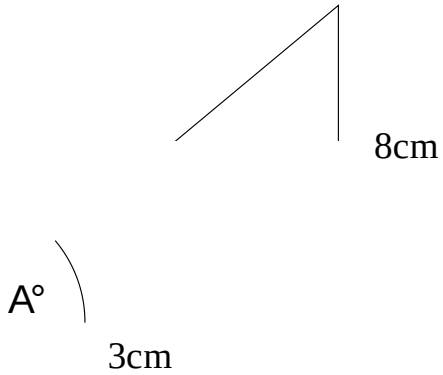
[2]

(c)



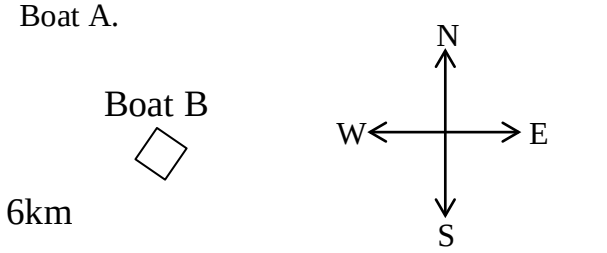
[2]

25. Calculate the size of angle A.



[2]

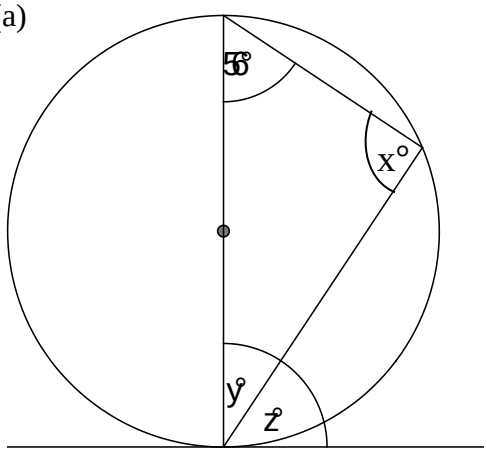
26. Three boats are in a race. Boat C is 10km east of Boat A. Boat B is 6km away from Boat A.



Calculate the bearing of Boat B from Boat A. [2]

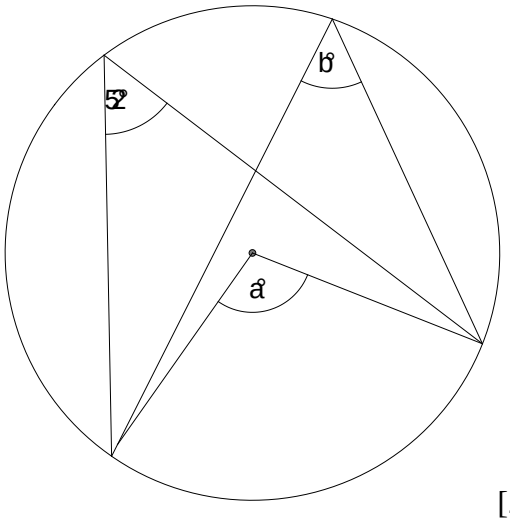
27. Give the values of *x* *y* and *z*. Give geometrical reasons.

(a)



[3]

(b) Find the values of *a* and *b*. Give geometrical reasons.



[2]

Section D: Statistics & Probability (25 marks)

28. The following back-to-back stem and leaf plot shows the test scores for two year 10 Maths classes.

Class A		Class B
8 5	9	0
7 4 0	8	3 5
9 8 5 3 1 0	7	0 1 4 6
9 8 8 7 6 5 3	6	2 4 5 8 9
5 5 3	5	3 5 8 8 9
	4	4 5 6 7
	3	0 1 2
	2	

(a) Calculate the following statistics for **<u>both</u>** classes.

i. Range
ii. Medians
iii. Lower and upper quartiles

[5]

(b) On the answer sheet provided at the back of this examination, draw a box and whisker graph <u>for each class</u>. [4]

(c) Refer to your graph and calculations to compare the test scores between the two classes. You must justify comments with references to your statistics or graphs. [2]

29. The table below shows the number of junior students in a school who can and cannot swim.

(a) Copy the table onto your answer paper and fill in the missing numbers [1]

	Can Swim	Can Not Swim	Total
Year 9		85	300
Year 10	269	31	300
Year 11	293		
Total	777	123	900

(b) If a student is selected at random, calculate the probability that:

i. A student can swim [1]

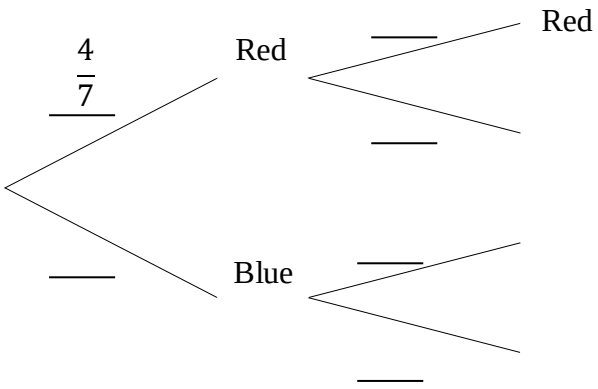
ii. A student is from Year 9 and cannot swim [1]

iii. A student can not swim [1]

(c) If a student can not swim, what is the probability that they are in Year 10? [1]

30. A bin contains 3 blue and 4 red marbles. A marble is selected from the bin and it's colour is noted. It is then replaced. A second marble is then drawn and its colour noted.

(a) Complete the probability tree shown below, which has been reproduced on your answer sheet that was attached to the back of this examination. [1]



(b) Find the probability of the following:

i. Both marbles are blue [1]

ii. The first marble is red and the second is blue [1]

iii. One marble of **each** colour is drawn [1]

31. In a class of 25 students, 19 play sport, 7 play a musical instrument and 4 do both. Let S represent the event a student plays sport and M represent the event that a student plays a musical instrument.

(a) Show this information in a Venn diagram [1]

(b) Calculate the probability that:

i. A student plays a sport **and** a musical instrument. [1]

ii. A student plays a sport, a musical instrument or both [1]

iii. $P(S')$ [1]

iv. $P(S' \cap M')$ [1]

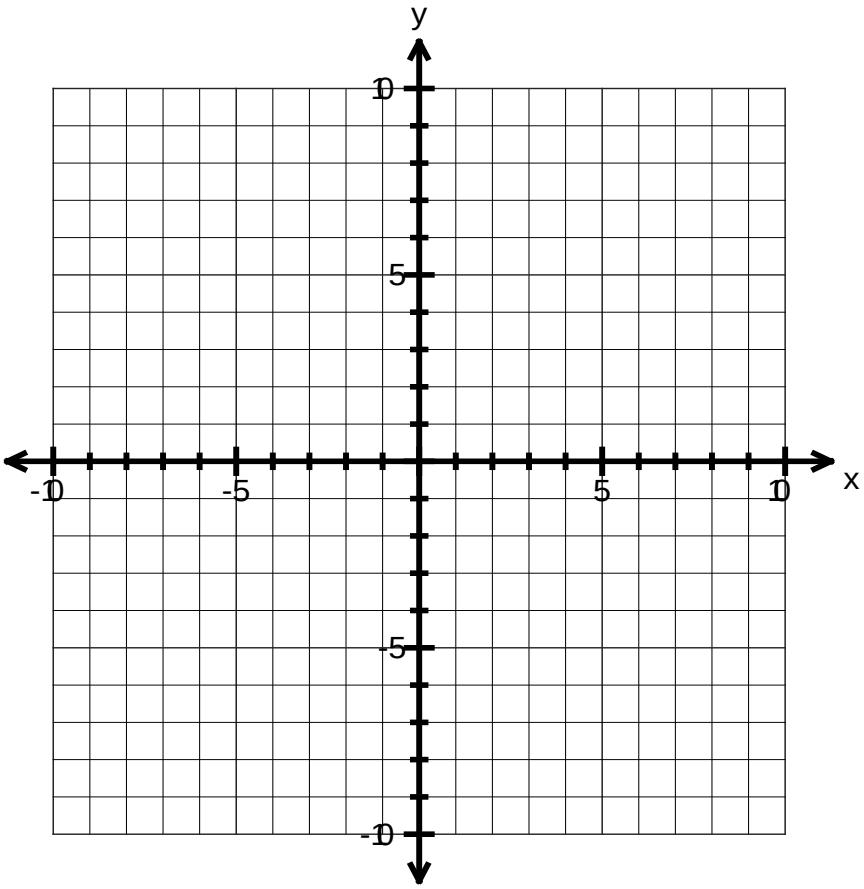
The End ☺

YEAR 10 COMMON TEST TERM 4 – ANSWER SHEET

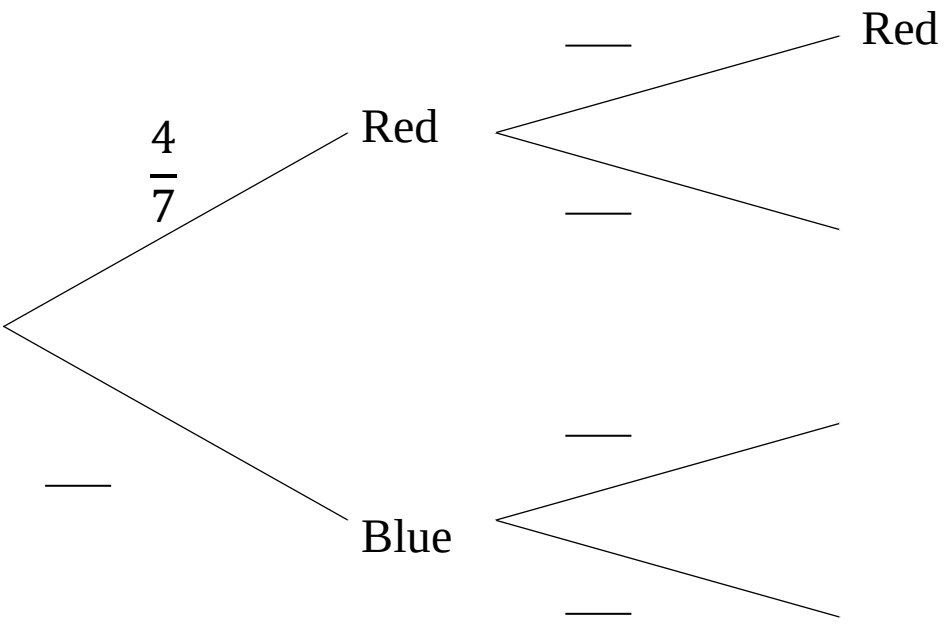
Please detach this sheet from the test paper and write your name and your maths teachers code in the spaces provided.

Name: _____ Teacher Code:_____

Question 8c



Question 30a



Please turn over for Question 28b

Question 28b