Section A: Algebra and Graphs (50 marks)

1. Simplify

(a) $4x + x^2 - 3x^2 + 7x$ [1]

(b) $3p \times 7pq$ [1]

(c) $5xy - 2xy^2 + 5xy - 2yx$ [1]

(d) $\frac{14h^5}{2h}$ [1]

(e) $\frac{18y}{6y^3}$ [1]

2. Expand and Simplify

(a) $(x+1)(x+3)$ [2]

(b) $(x-5)(x+7)$ [2]

(c) $(x-3)^2$ [2]

(d) $(x-5)(3-x)$ [2]

(e) $2(x-5)-3(x-7)$ [2]

3. Factorise fully

(a) $5x+15xy$ [1]

(b) $4x^2y^3+12x^4y^2$ [1]

(c) $x^2+3x-10$ [1]

(d) $x^2-3x-28$ [1]

(e) v^2-121 [1]

4. Solve

(a) $12x=132$ [1]

(b) $4t-3=23$ [1]

(c) $2(3x+7)=38$ [2]

(d) $2(4x+3)=30$ [2]

(e) $(x-2)(x-3)=0$ [1]

(f) $(x+4)(x-5)=0$ [1]

(g) $\frac{3y-8}{4} - 3 = 7$ [3]

(h) $(2x-1)(4-x)=0$ [2]

5. Use the pattern to find the missing values of ***A*** and ***B***.

(a)

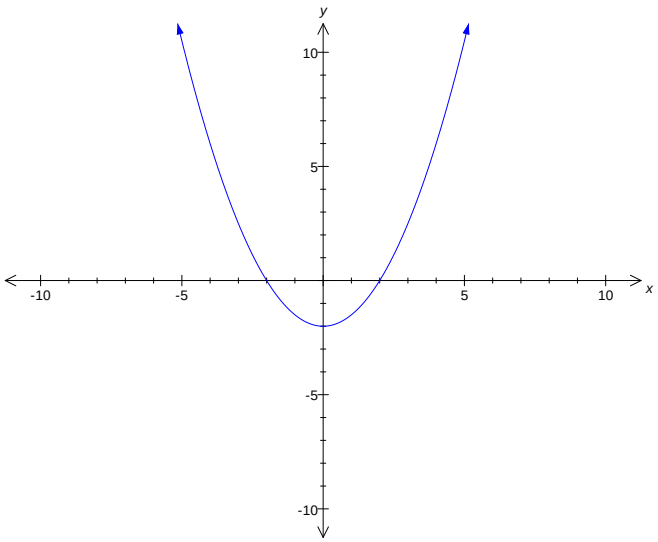
x	***y***
1	1
2	5
3	9
6	***A***
--	--
B	101

[2]

(b) Write down an equation for y in terms of x for the table above

[2]

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

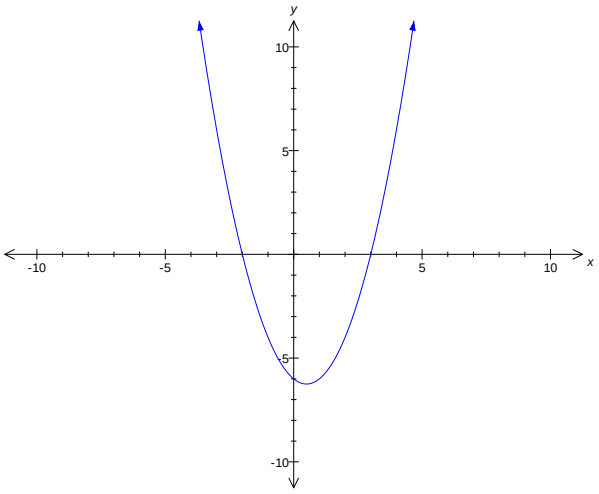


(a) the *y*-intercept [1]

(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. $y = 0.5x^2 - 2$ [1]

For the curve drawn below, state the following:



(c) the y-intercept [1]

(d) the x-intercepts [1]

(e) the factors of the equation [2]

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

x	***y***
1	-3
2	2
3	7
4	12

[2]

8. The perimeter of this rectangle is 40m. Form and solve an equation to find a value for *x*, and hence find the dimensions of the rectangle.

2*x* - 3

x + 2

[3]

9. What is the area of the rectangle above? [2]

Section B: Number (20 marks)

10. Round the following numbers to the accuracy required:

(a) 485346 (2 sig.figs.) [1]

(b) 0.0043564 (3 sig.figs.) [1]

11. Round the following numbers to the accuracy required:

(a) 376.338 (2 d.p.) [1]

(b) 0.09298200 (4 d.p.) [1]

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

a) 0.03246×10^3 b) $5-\sqrt{4.2-1.7}$

c) 3.8×4^6 d) $\frac{12+(2+4)^2}{4^2-8}$

e) $\sqrt[3]{343}$ f) $3 \times 5 - 2 \times 7$ [6]

13. Divide 104 into the ratio 2:7:4 [2]

14. Reduce 374 kg by 12% [2]

15. Calculate $2\frac{1}{6} \times 2\frac{3}{5}$ [1]

16. Calculate $3\frac{2}{5} \div 1\frac{7}{8}$ [1]

17. Write 48% as a fraction in its simplest form [1]

18. Write $\frac{13}{20}$ as a decimal. [1]

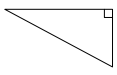
19. What is $\frac{3}{8}$ of 176? [1]

Section C: Pythagoras' Theorem, Trigonometry and Measurement (29 marks)

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

20. Calculate the unknown lengths

(a)



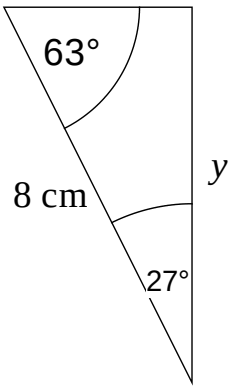
x

7m

15m

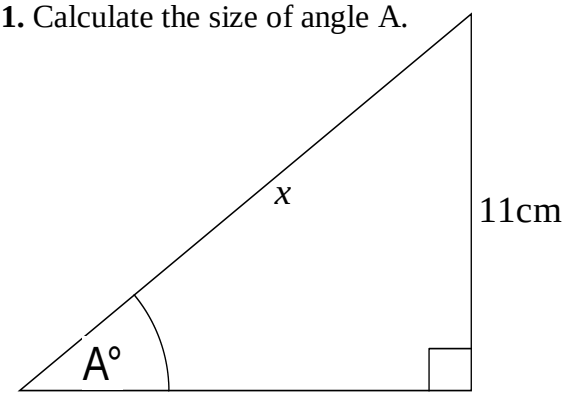
[2]

(b)



[2]

21. Calculate the size of angle A.



[2]

22. Work out *x* in the triangle in question 21.

[2]

23. Clumpton is a city 7km south of Arnington. Braeville is another city that lies 4km east of Arnington.

7km

Clumpton

(a) Calculate the bearing of Braeville from Clumpton. [1]
(b) How far is it from Clumpton to Braeville? [1]
(c) Calculate the bearing of Clumpton from Braeville. [2]

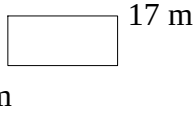
24. Convert the following to cm:

(a) 1.76 m
(b) 5 mm
(c) 0.26 km

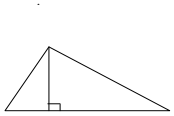
[3]

25. Calculate the area of the following shapes. State your units. [4]

(a)



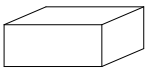
(b)



26. Convert the following measurements into the stated units:

(a) 3 m^2 = …… cm^2 [2]
(b) 2 Ha = …….. m^2 [2]

27. Calculate the volume of the following cuboid.



[2]

28. Complete the graphs on the student answer sheet. [4]

Section D: Statistics & Probability (26 marks)

29. This stem and leaf plot shows the test scores (out of 100) for a Year 10 Maths class (Class A). **A copy of this is on the student answer sheet if you wish to draw on it.**

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

(a) What is the range for this set of data? [1]

(b) What is the 7^{th} lowest mark? [1]

(c) What is the median test score? [1]

30. Another class (Class B) sat the same test. Their results are listed below.

57, 65, 76, 45, 65, 87, 54, 65, 32, 16, 37, 54, 58, 53, 65, 76, 43, 47, 23, 53, 32, 43, 65 ,34

For the 2^{nd} class's test scores, calculate:
(a) the mean;
(b) median;
(c) upper quartile;
(d) lower quartile.

[4]

31. The following is a frequency table showing the number of lollies contained in a packet.

Lollies in a Packet	Frequency
11	2
12	17
13	45
14	58
15	26
16	11

(a) What is the mode number of lollies per packet? [1]

(b) Calculate the mean number of lollies per packet. [2]

(c) If you had 5000 packets of lollies, how many of them would you expect to contain 15 lollies? [2]

32. A group of Y11 students were comparing the Dominion Post and a Harry Potter novel. The lengths of each sentence of 300 randomly selected sentences are summarised in the table below.

Length of Sentence (Words)	Dom Post	Harry Potter
5 – 7	33	56
7 - 9	153	116
10 - 12	74	83
13 - 15	27	26
16 - 18	13	19
Total	300	300

a) If you randomly choose a sentence from the Dom Post, what is the probability it has between 7 - 9 words? [1]

b) What is the probability that a randomly selected sentence from Harry Potter has over 12 words? [1]

(c) If a selected sentence from the 2 sources, has 7- 9 pages, what is the probability it is from Harry Potter? [1]

33. Trevor scores a goal in a game with a probability of 0.7. Matt scores a goal in game with a probability of 0.3.

(a) What is the probability that Trevor does not score in a game? [1]

(b) What is the probability that Trevor and Matt both score in a game? [1]

(c) What is the probability that only one of them is successful in a game? [2]

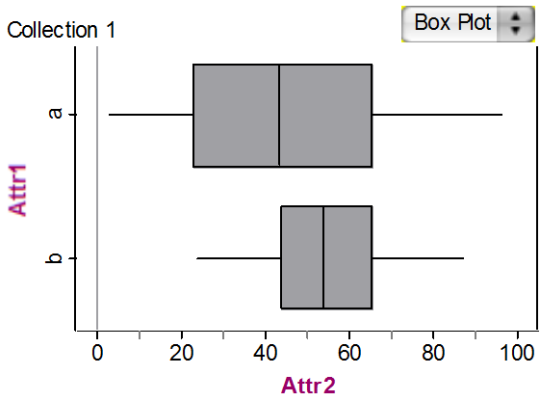
34. A box contains 3 red balls, 2 green balls and a blue ball. A ball is randomly selected, its colour noted and replaced and then another is selected.

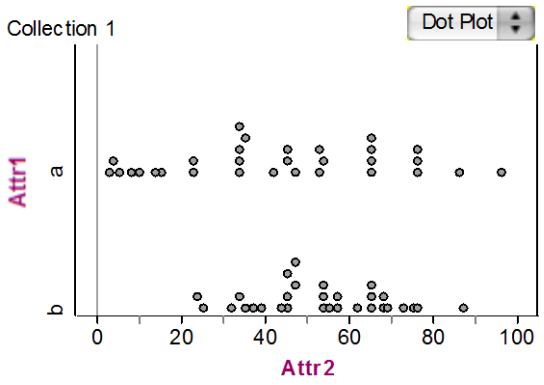
(a) What is the probability that 1 green and 1 red ball is selected? [1]

(b) What is the probability that 2 balls of the same colour are selected? [1]

(c) What is the probability that at least one green ball is selected? [2]

35. The diagrams following show the box and whisker graphs, dot plots and summary statistics of test scores for 2 classes, class a and class b. Write 3 statements comparing the 2 classes.





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Collection 1

	Attr1		Row Summary
	a	b	
Attr2	30	30	60
	42.8333	53.4333	48.1333
	3	24	3
	23	44	34
	43.5	54	47
	65	65	65
	96	87	96

S1 = count ( )
S2 = mean ( )
S3 = min ( )
S4 = Q1 ( )
S5 = median ( )
S6 = Q3 ( )
S7 = max ( )

[3]