DULWICH COLLEGE
FOUNDED 1619

YEAR 7 ENTRANCE AND SCHOLARSHIP EXAMINATION
Mathematics
Specimen Paper F

Mark Scheme

Time allowed for this paper: 1 hour

Instructions

- Attempt all the questions.
- Calculators must not be used.
- Show all of your working on this paper.
- There are 100 marks available in total for this test.
- You must not write in the squares on the bottom right of each page.
- The marks available for each part of a question are given in square brackets.

Method marks – any sensible method with just a minor slip.

Calculate:

1. 2017 + 597

2017
597
2614
1 1

M1

Answer: 2614 A1 [2]

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2. 63 × 42

63
42 ×
126
2520
2646

M1

Answer: 2646 A1 [2]

---

3. 6.48 ÷ 6

1.08
6|6.48

M1

Answer: 1.08 A1 [2]

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4. 7.257 – 3.47

6 1 1
7.257
3.470 –
3.787

M1

Answer: 3.787 A1 [2]

PAGE ONE

Page total: 8

5. Write down the missing terms in each of the sequences below:

(a) 3, 9, 15, 21, 27, 33 [2]

(b) 32, 16, 8, 4, 2, 1 [2]

(c) 100, 132, 116, 124, 120, 122, 121 [2]

(d) 1, 2, 6, 24, 120, 720, 5040 [2]

720 × 7 = 5040

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6. Circle the factors of 99:

9	198	990	33
66	11	18	48

A2 - all 3, no incorrect

A1 3 correct plus one incorrect OR 2 correct, no incorrect. [2]

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7. Subtract 20 + (1 × 7) from (20 + 1) × 7.

27 147

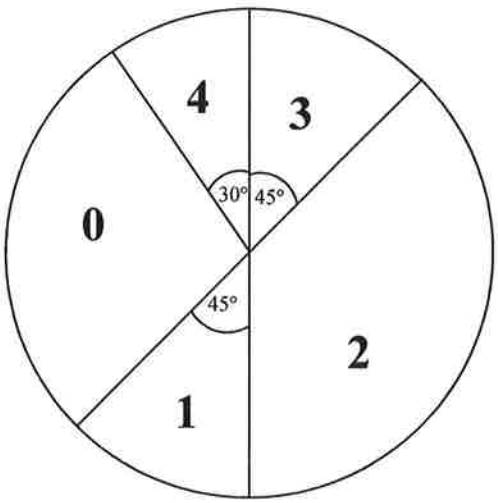
147 − 27 = 120

Answer: 120 [2]

PAGE 2

Page total: 12

8. In a survey a group of children were asked how many films they had seen in the last week. No-one in the group had seen more than four films, and the results are shown in the pie chart below.



(a) Work out the percentage of children who had seen exactly three films.

M1 $\frac{45}{360} = \frac{1}{8}$

A1

Answer: 12.5 % [2]

(b) Work out the fraction of children who had seen no films, giving your answer in its lowest terms.

$180 - 30 - 45 = 105$ M1

M1 $\frac{105}{360} = \frac{7}{24}$

A1

Answer: $\frac{7}{24}$ [3]

Nine of the children who were surveyed had seen exactly one film and another nine had seen exactly three films.

(c) Fill in the table below to show the number of children who had seen 0, 2, and 4 films.

$5^0 = 1$ Still could.

Number of films	0	1	2	3	4
Number of children surveyed	21	9	27	9	6

A1 A1 A1

$\frac{105}{5} = 21$ $\frac{135}{5}$ $\frac{30}{5}$ [3]

Page total: 8

9 ~~10~~. (a) Calculate $0.35+\frac{4}{5}+\frac{37}{100}$, leaving your answer as a decimal.

M1 conversion to decimals

$$\begin{array}{r} 0.35 \\ 0.80 + \\ 0.37 \\ \hline 1.52 \end{array}$$

as a fraction $\frac{38}{25}$

M1 sensible attempt at addition

A1

Answer: 1.52 [3]

(b) Write $\frac{21}{70}$ as a decimal.

$$\frac{21}{70} = \frac{3}{10} \left(= \frac{30}{100}\right) = 0.3$$

M1

A1

Answer: 0.3 [2]

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10 ~~11~~. Simon and Fiona are sharing a cupboard. If Simon's things take up $\frac{2}{5}$ of the space and Fiona's things take up $\frac{2}{7}$ of the space, what fraction of the cupboard is empty?

M1

$$1 - \frac{2}{5} - \frac{2}{7} = 1 - \frac{14}{35} - \frac{10}{35}$$

$$= \frac{35-24}{35}$$ M1

$$= \frac{11}{35}$$

A1

Answer: $\frac{11}{35}$ [3]

Page total: 8

11 ~~12~~. (a) Round 1619 to the nearest 10.

A1

Answer: 1620 [1]

(b) Round 2017 to the nearest 100.

A1

Answer: 2000 [1]

---

12 ~~13~~. A, B and C and D are 4 points on a grid. A is at (5, 1), B is at (1, 1) and C is at (1, 3) and D is at (5, 4).



G1 all correct

(a) Plot the points B, C and D and then connect them to form the quadrilateral ABCD.

[1]

(b) State what type of quadrilateral has been formed.

Answer: Trapezium [1] A1

(c) The side length of each small square in the grid is 1 cm. Work out the area of the quadrilateral ABCD.

8 + 2 o.e

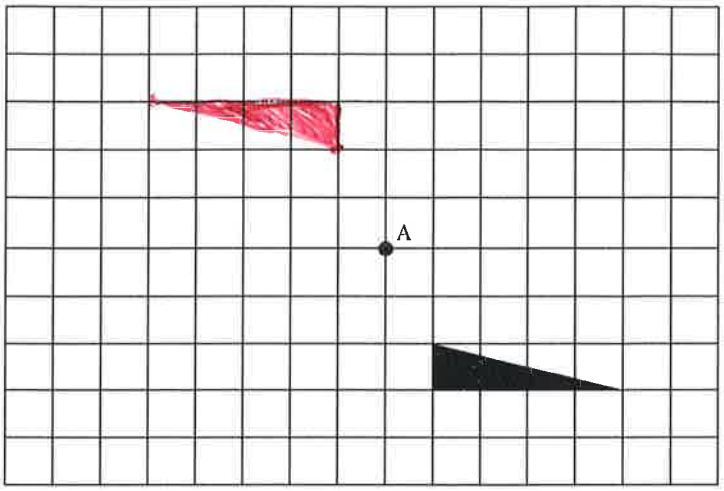
M1

A1

Answer: 10 cm^2[2]

PAGE 5

13 ~~14~~. Rotate the triangle through 180° about the point marked A

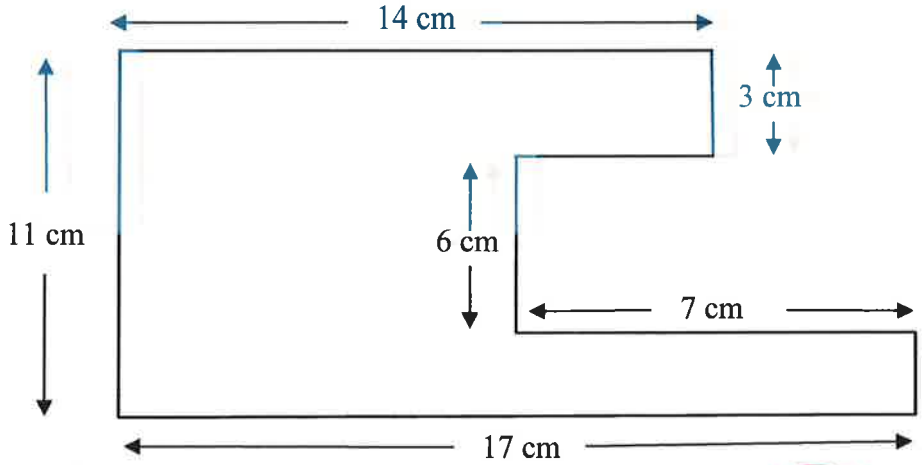


A1 right way up
A1 right location.

[2]

~~15~~ 14. Work out the perimeter of this shape.

Note: all angles are right angles but the diagram has not been drawn to scale.



M1

M1

14 + 11 + 3 + 6 + 7 + 2 + 17 + 4 = 64

(or 11+11 + 14+17 + 7 without working out 2cm)

A1

Answer: 60 cm [3]

Page total: 5

~~16~~ 15. The example below shows a quick way to work out the difference between two square numbers.

$$19^2 - 16^2 = (19 + 16)(19 - 16) = 35 \times 3 = 105$$

Use this method to work out the following:

(a) $17^2 - 13^2$

M1 $(17+13)(17-13)$

$= 30 \times 4$

A1

Answer: 120 [2]

(b) $888^2 - 112^2$

M1 $(888+112)(888-112)$

$= 1000 \times$ ~~776~~ 776

A1

Answer: 776000 [2]

(c) $7.5^2 - 2.5^2$

M1 $(7.5+2.5)(7.5-2.5)$

$= 10 \times 5$

A1

Answer: 50 [2]

~~17~~ 16. The mean (average) of five numbers is 28. The mean of a different set of twelve numbers is 11. Calculate the mean of all of the numbers together.

M1 $28 \times 5 + 12 \times 11 = 140 + 132 = 272$

$\frac{272}{17} = 16$

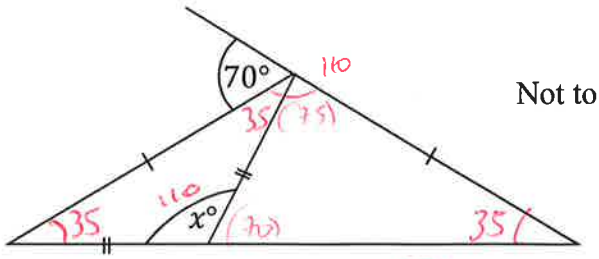
M1

A1

Answer: 16 [3]

Page total: 9

18. Work out the value of x from the diagram below.



Not to scale

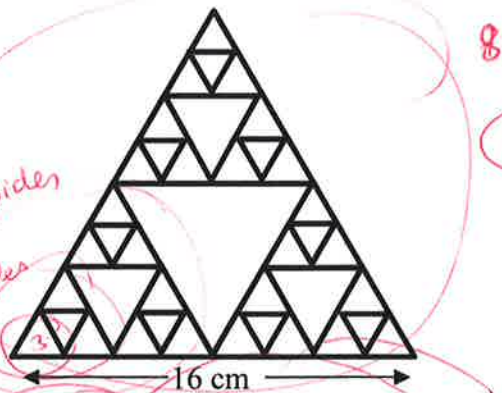
M1 for any correct 35° angle.

$x = 180 - 35 - 35$ M1

Answer: $x =$ 110 A1 [3]

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19. The shape below is made up of equilateral triangles. The side length of the largest triangle is 16 cm. Work out the total length of all of the lines used to draw the shape.



81 sides

B1 for 81

27 sides

9 sides

3

each small side = 2cm B1 for 2cm

81 × 2 = 162

Answer: 162 cm A1 [3]

Page total: 6

20. Jon has 30% more money than Miguel and together they have £46. Calculate how much money Jon has.

19.

Ratio 13 : 10 M1

26 : 20

£26 : £20 M1

or alternative method.

Answer: £ 26 A1 [3]

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21. A group of children are playing a game where they can score either 2, 3 or 5 points on each turn. The children have had 8 turns each and recorded their scores in a table, but some of the entries have been deleted. Fill in the missing numbers to give a complete set of scores.

20.

Name	2 points	3 points	5 points	Total Score
Carl	1	6	1	25
Alex	4	2	2	24
Yusuf	3	3	2	25
Jing	1	1	6	35
Charlotte	6	2	0	18

A1 for both 24 and 25

A1 for both 2 and 3

A2 for 3, 1, 6 award A1 for 2 out of 3

A2 for 6, 2, 0 Award A1 for 2 out of 3.

[6]

Page total: 9

22. 21. Write each of the numbers 80, 81, 82, 83, 84 and 85 in the spaces below, using each number only once, to make all of the statements true.

81 is a square number 81

83 is a prime number 83

80 is a multiple of 5 80 85

85 is the product of two prime numbers 82 85

82 is double a prime number 82

84 is a multiple of 3 81 84

A4 all correct
-1 for each incorrect
to minimum of ~~0~~ no

[4]

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23. 22. James cycles 4000m at 10 metres per second. Tom takes 100 seconds more to cycle the same distance. At what speed does Tom cycle?

James takes 400s

Tom takes 500s M1

M1 $\frac{4000}{500} = 8$

Answer: 8 A1 metres per second [3]

PAGE 10

Page total: 7

~~24.~~ 23. The instruction $x \spadesuit y$ means double x and add y.

For example: $5 \spadesuit 3 = 2\times5 + 3 = 13$

(a) Work out the value of $14 \spadesuit 55$

$2\times14 + 55 = 83$ M1

Answer: 83 A1 [2]

(b) What is the value of a if $9 \spadesuit a = 31$

$18 + a = 31$ M1

Answer: 13 A1 [2]

(c) What is the value of b if $b \spadesuit 10 = 16 \spadesuit b$

$2b + 10 = 32 + b$ M1

$b = 22$

Answer: 22 A1 [2]

(d) The numbers c and d are such that $c \spadesuit d = d \spadesuit c$. Work out the value of $d - c$.

$2c + d = 2d + c$ M1

$c = d$

Answer: 0 A1 [2]

Page total: 8

24. ~~25~~. The cards below have letters on one side, and the numbers 1, 2, 3, 4, 5, 6 and 7 on the other side (but not necessarily in this order on the cards).

P	H	A	B	L	E	T

You are told that:

A	L	P	H	A	B	E	T

adds up to 35

PHABLET = 1+2+3+4+5+6+7 = 28 M1

(a) Find the value of | A |

35 - 28 = 7

Answer: 7 [2] A1

You are also told that

A	L	P	H	A

adds up to 20.

(b) Work out what the following add up to.

B	E	T	A

BETA = ALPHABET + A - ALPHA

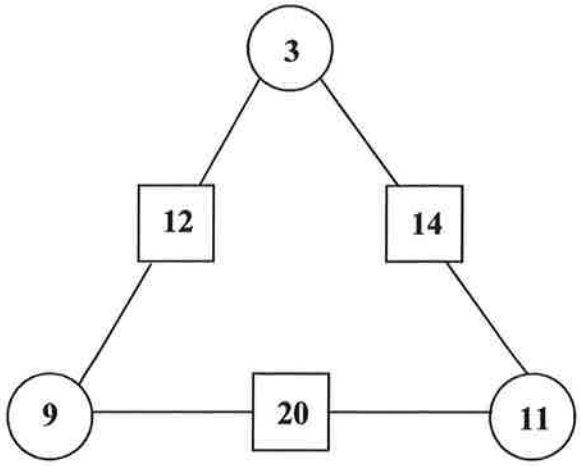
= 35 + 7 - 20 M1

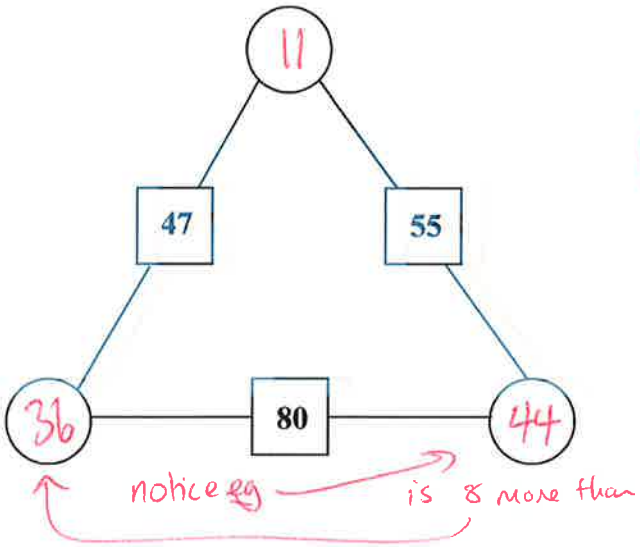
= 22

Answer: 22 [2] A1

Page total: 4

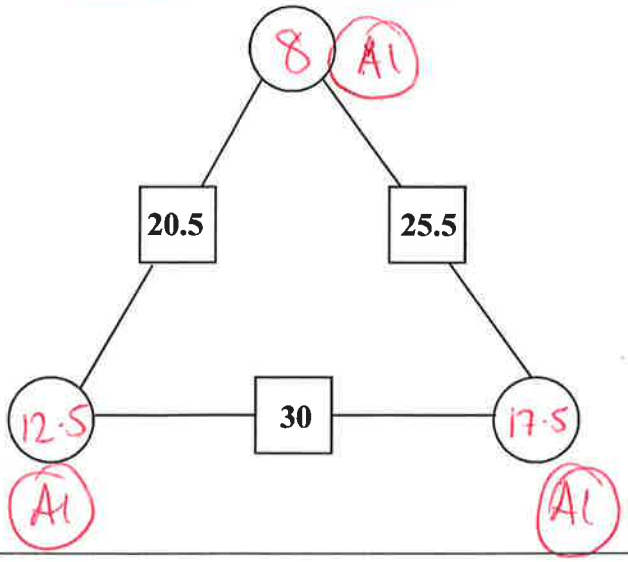
26. Along any line drawn, the numbers in the two circles at the end of a line should add together to make the number in the square between the two circles, as in the first example. Fill the remaining circles with numbers obeying this rule.





A2 all correct
A1 2 out of 3.

[2]

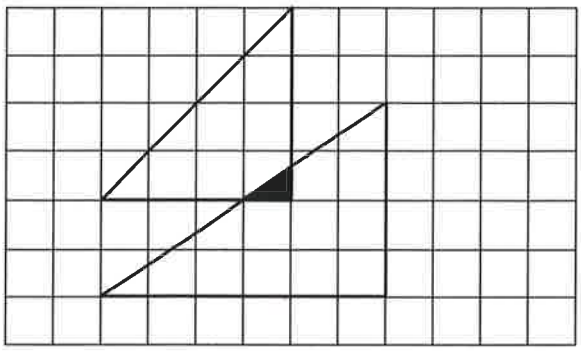


[3]

PAGE 13

Page total: 5

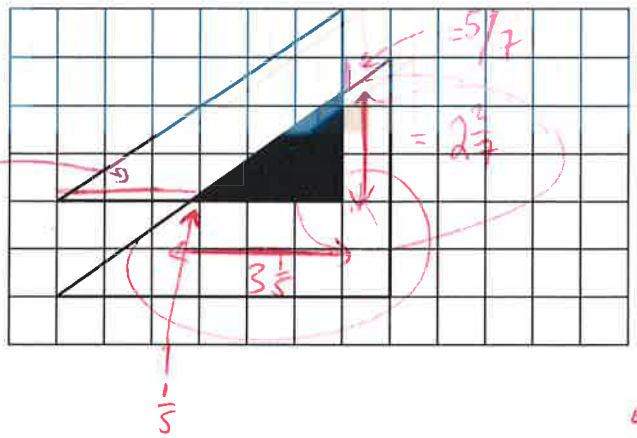
~~27.~~ 26. Each of the diagrams below shows a pair of triangles drawn on a grid of squares of side length 1cm. Each corner of each triangle lies exactly at the corner of a square. The overlap between each pair of triangles is shaded. Work out the area of the shaded region in each case.



$= \frac{1}{2} \times 1 \times \frac{2}{3} = \frac{1}{3}$

M1

Answer: $\frac{1}{3}$ cm^2 [2] A1



M1 for either $2\frac{2}{7}$ or $3\frac{1}{5}$ correct

Other sensible approaches could earn method marks – please ask if unsure!

M1 dependent on correct sides

So $\frac{1}{2} \times 3\frac{1}{5} \times 2\frac{2}{7} = \frac{1}{2} \times \frac{16}{5} \times \frac{16}{7} = \frac{128}{35}$

Answer: $\frac{128}{35}$ cm^2 [3] A1

Page total: 5

End of the Examination

If you have time, go back and check your answers and make sure that you have shown all of your working.