DULWICH COLLEGE
FOUNDED 1619

YEAR 7 ENTRANCE AND SCHOLARSHIP EXAMINATION

Specimen Paper D – Mark Scheme

Time allowed for this paper: 1 hour

Instructions

- Attempt all the questions.
- Calculators must not be used.
- Show all 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.

Allow alternative methods

Calculate:

1. 828 + 191

$$\begin{array}{r} 828 \\ 191 + \\ \hline 1019 \\ \hline \end{array}$$ M0

Answer: 1019 [2] A1

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2. 637 – 473

$$\begin{array}{r} {}^{5}\not{6}{}^{1}37 \\ 473 - \\ \hline 164 \\ \hline \end{array}$$ M1

Answer: 164 [2] A1

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3. 391 × 7

$$\begin{array}{r} 391 \\ 7\times \\ \hline 2737 \\ \hline \end{array}$$ M1

Answer: 2737 [2] A1

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4. 602 ÷ 7

$$\begin{array}{r} 86 \\ \hline 7\,|\,60^{4}2 \end{array}$$ M1

Answer: 86 [2] A1

Page total:

5. 4.6 – 3.55

$$\begin{array}{r} 4.^{5}\cancel{6}0 \\ 3.55 - \\ \hline 1.05 \end{array}$$

M1

Answer: 1.05 [2] A1

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6. Fill in the missing numbers from these sequences:

(a) 29, 37, 45, 53, 61, 69 A1 A1

(b) 31, 28.5, 26, 23.5, 21, 18.5 A1 A1

[4]

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7. Circle the multiples of 8:

16	4	24	6
2	1	8	30

A2 three correct, no other incorrect

Award A1 for two correct and no incorrect.
or three correct and one additional incorrect.

[2]

Page total:

8. (a) Round 1517 to the nearest 100.

Answer: 1500 [1] A1

(b) Round 8885 to the nearest 10.

Answer: 8890 [1] A1

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9. Subtract $7 + (3 \times 11)$ from $(7 + 3) \times 11$.

40 B1 110 B1

110 - 40 = 70

Answer: 70 [3] A1

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10. Circle which of the following has a different value from the others:

$3 - 7 - 4$ $(3 - 7) - 4$ $3 - (7 - 4)$ $((3 - 7) - 4)$ A2

= -8 = -8 = 0 = -8

A1 for clear evidence of working out any 3 correctly

[2]

Page total:

11. (a) Circle the fraction which has a different value from the others:

$\frac{6}{9}$ $\frac{2}{3}$ $\frac{18}{27}$ $\frac{7}{10}$

M1 for clear simplification of to $^2/_3$

eg $\frac{18}{27} = \frac{2}{3}$

or showing $\frac{7}{10} \neq$ one of the others

[2] A2

(b) Circle the smallest of the following fractions:

$\frac{1}{4}$ $\frac{1}{5}$ $\frac{5}{16}$ $\frac{1}{3}$

M1 for sensible attempt to compare eg

writing all over a common denominator

[2] A2

(c) Circle the largest of the following fractions:

$\frac{2}{3}$ $\frac{7}{9}$ $\frac{17}{27}$ $\frac{1}{2}$

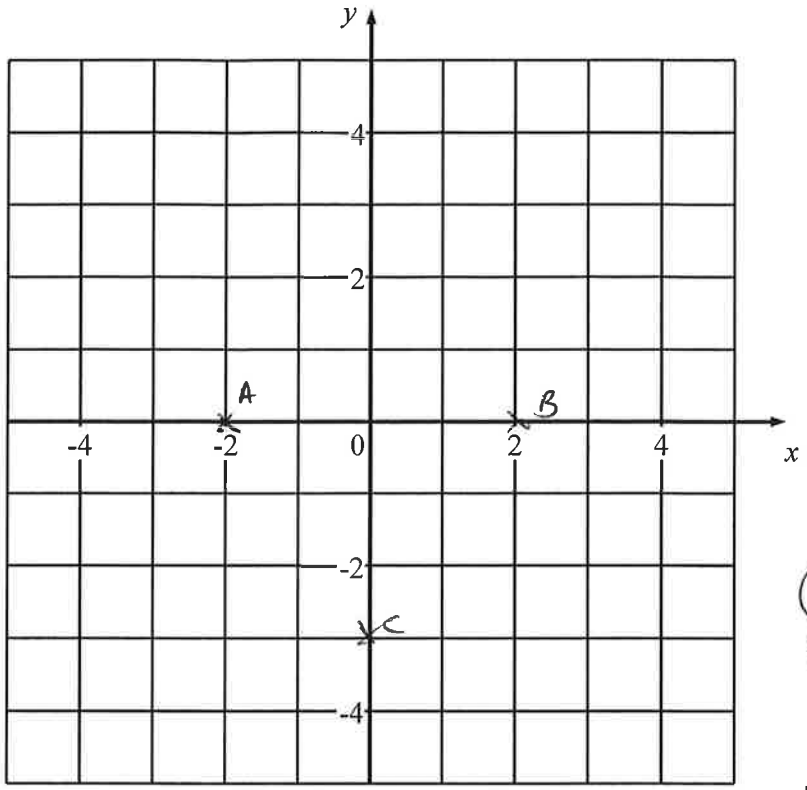
M1 for a sensible attempt to compare

A2

[2]

Page total:

12. (a) Mark the points A(–2, 0), B(2, 0) and C(0, –3) on the axes below, labelling each point clearly.



G3
1 for each correct

[3]

(b) The y co-ordinate of point D is 4 and ABCD is a kite. Write down the x co-ordinate of D.

A1

Answer: 0 [1]

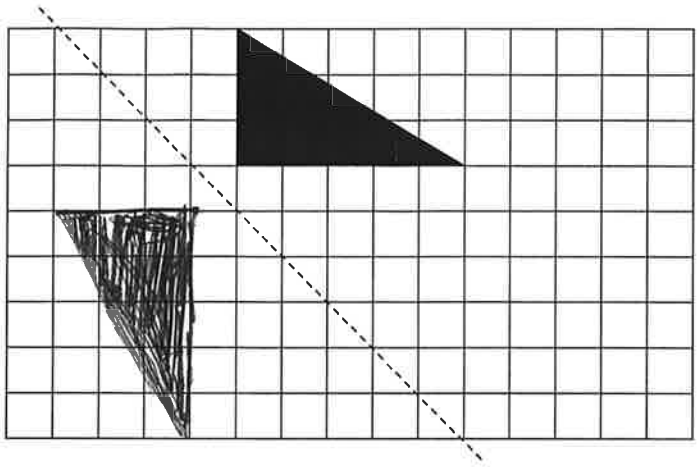
(c) The point E is such that ABCE is a rhombus. Write down the co-ordinates of the point E.

A1 A1

Answer: E is at (0 , 3) [2]

Page total:

13. (a) Draw the reflection of this triangle in the mirror line shown.



Mirror line

A1 correct reflection shape

A1 position exactly correct

ignore shading

[2]

(b) If the side of each square on the grid represents 1 metre, work out the area of the triangle, giving the units of your answer.

$\frac{1}{2} \times 3 \times 5 = 7.5$ M1

Answer: 7.5 units: m^2 [3]

(c) Work out the fraction of the total area of the grid the original triangle covers.

Area of triangle = 7.5 M1

Area of grid = 135

M1 $\frac{7.5}{135} = \frac{1}{18}$

Answer: $\frac{1}{18}$ A1 [3]

NB: other methods possible A3 for $\frac{1}{18}$ www.

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14. Circle which of the following numbers are square numbers:

9 55 81 13 21

A2 both correct, no additional incorrect.

[2]

A1 - either both correct and one additional incorrect OR one correct, no additional incorrect.

Page total:

15. (a) Write $\frac{6}{25}$ as a decimal.

$\frac{24}{100}$ M1

A1

Answer: 0.24 [2]

(b) Calculate $0.35 + \frac{3}{5} + \frac{1}{4}$, leaving your answer as a decimal.

0.35
0.60
0.25
1.20

M1 conversion to decimals, both correct

M1 adding

A1

Answer: 1.2 [3]

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16. A sleeper train leaves London at 10:17 pm and reaches Edinburgh at 5:44 am.

(a) Calculate out how long the journey takes in hours and minutes.

A1 A1

Answer: 7 hours 27 minutes [2]

(b) An aeroplane takes 7 hours to travel from London to New York at a constant speed. The distance from London to New York is approximately 5600 kilometres. Calculate the approximate speed of the aeroplane in kilometres per hour.

M1 $\frac{5600}{7} = 800$

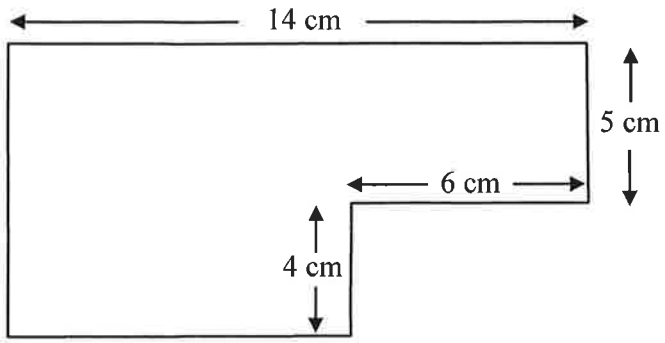
A2

Answer: 800 kilometres per hour [3]

Page total:

17. Work out the area and perimeter of this shape.

Note: all angles are right angles.



$14 \times 5 = 70$ (M1)

$8 \times 4 = 32$ (M1)

$70 + 32 = 102$

(or $(14 \times 9) - (6 \times 4) = 102$)

Answer: Area = 102 cm² (A1) [3]

$14 + 5 + 6 + 4 + 8 + 9$

(M1) adding at least 4 correct sides

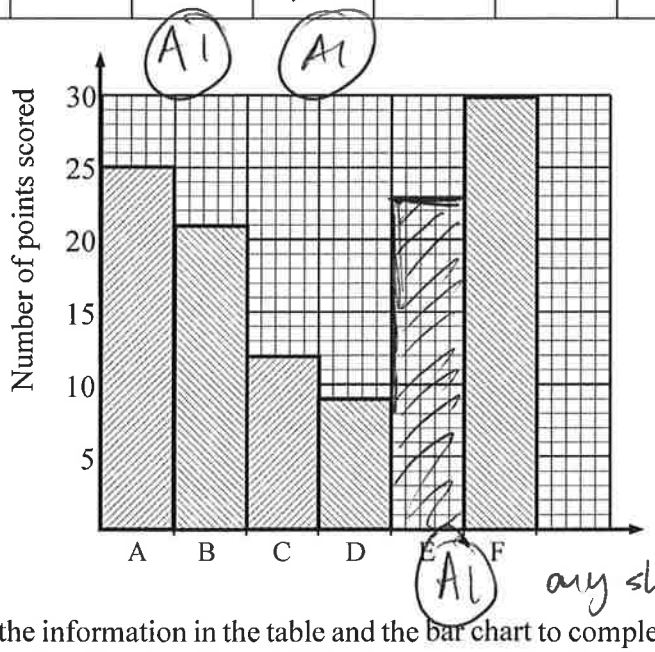
(M1) identifying lengths that are not labelled

Answer: Perimeter = 46 cm (A1) [3]

Page total:

18. The table and bar chart below are to show the number of points scored by a rugby team over the first six matches of a season.

Match	A	B	C	D	E	F
Number of points scored	25	21	12	9	23	30



(a) Use the information in the table and the bar chart to complete the missing entries for **Matches B and C** in the table and the bar for **Match E** on the chart.

[3]

(b) Calculate the range of the different numbers of points scored by the team across the six matches.

30 − 9
M1

Answer: 21 (A1) points [2]

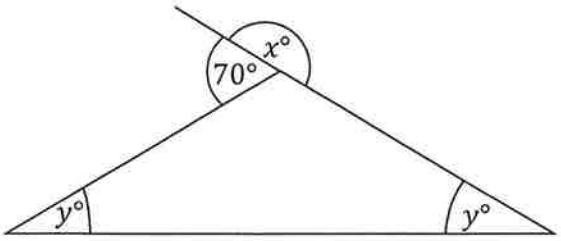
(c) Calculate the mean (average) number of points scored by the team per match.

$\frac{25+21+12+9+23+30}{6} = \frac{120}{6} = 20$
M1

Answer: 20 points [2]
A1

Page total:

19. The diagram shows a triangle and a line. The two angles marked $y°$ are equal.



(a) Write down the value of x.

Answer: $x =$ 180° [1] A1

(b) Work out the value of y.

180 - 70 = 110 180 - 110 = 70

180 - 70 = 110 M1 70 ÷ 2 = 35

Answer: $y =$ 35 [2] A1

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20. Twelve balls labelled 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 are placed in a bag and one ball is chosen at random.

(a) Circle which of the following is more likely:

The ball shows a multiple of 3	The ball shows an even number

A1

[1]

(b) Explain your answer clearly:

There are 6 even numbers 2, 4, 6, 8, 10, 12 A1

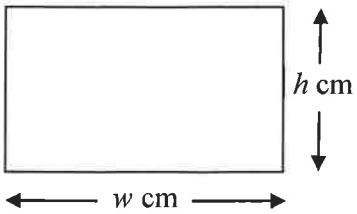
but only 4 multiples of 3 3, 6, 9, 12. A1

or eg working out probabilities of 1/2 and 1/3. [2]

A1 for imprecise answer eg "more even numbers".

Page total:

21. A rectangle has width w cm and height h cm.



(a) Write down a formula for the perimeter of the rectangle in terms of w and h.

$2w + 2h$ or $2(w+h)$ A2 allow any correct expression.

Answer: $w+w+h+h$ cm [2]

(b) The area of the rectangle is 55 cm^2 and both w and h are prime numbers. Calculate the perimeter of the rectangle.

w and h must be 5 and 11 B1

M1 So perimeter = 5 + 5 + 11 + 11 = 32

Answer: 32 A1 cm [3]

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22. The mean (average) of seven numbers is 12. An eighth number is included and the mean decreases to 11. Find the number which was included.

$12 \times 7 = 84$ M1
$11 \times 8 = 88$

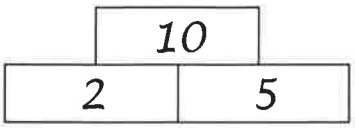
$88 - 84 = 4$ M1

Answer: 4 A1 [3]

Page total:

23. Towers of blocks are made such that the number showing on each block above the bottom row is found by multiplying the numbers in the two blocks on which it stands.

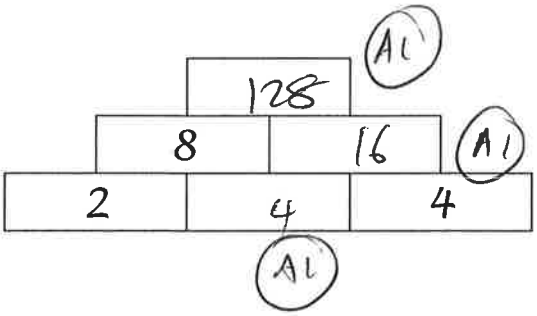
For example:



as $10 = 2 \times 5$.

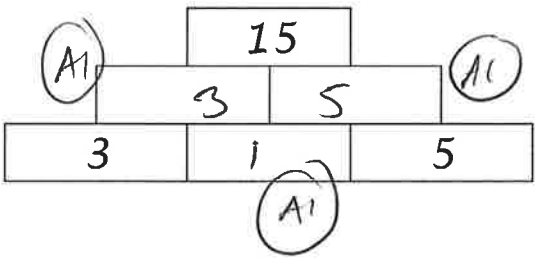
(a) Fill in the missing numbers in the following:

(i)



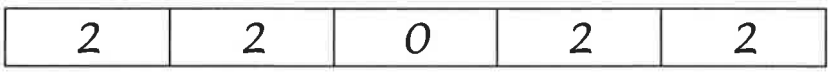
[3]

(ii)



[3]

(b) A tower with five rows is made and the bottom row is:



Write down the number which will appear at the top of this tower.

Answer: 0 [2] A2

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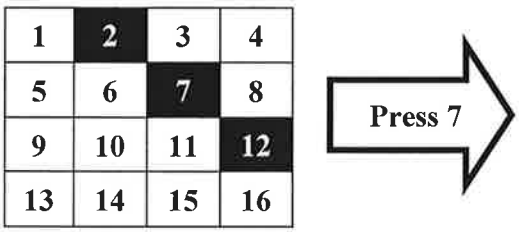
24. A children's toy game consists of 16 square buttons, some of which are black, and some white. When a button is pressed, that square and the squares immediately above it, below it and to its left and right change from being black to white and vice versa.

For example:





(a) Show the effect of pressing button 7 by shading squares on the pattern below:

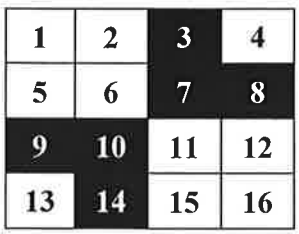


A2

A1 for either one missing or one extra shaded (but not both)

[2]

(b) The object of the game is to make all the squares white. Which **two** buttons could you press from the following position to win the game?



A2 must be both.

Answer: 7 and 10 [2]

Page total:

25. The symbols ■, □, ♠, ♣, ♥, ♦, ☼, and ○ each represent different prime numbers less than 20 and the following statements are true:

$$\square \times \spadesuit = 15$$
$$\square \times \heartsuit = 35$$

Write down the value of:

(a) □

Answer: 5 [1] A1

(b) ♠ + ♥

Answer: 10 [1] A1

The following statements are also true:

$$\bigcirc \times \bigcirc = 121$$
$$\heartsuit \times \bigcirc \times \clubsuit = 1001$$

Write down the value of:

(c) ○

Answer: 11 [1] A1

(d) ♣

Answer: 13 [1] A1

(e) ■ + ♦ + ☼

Answer: 38 [2] A1

Page total:

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.