FOUNDATION

1.13 Pictograms: 2-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 120 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Four schools took part in a tree-planting scheme. The table shows the number of trees planted by each school. A pictogram is to be drawn using the key: 1 tree symbol = 10 trees.

School	Number of trees
A	40
B	25
C	60
D	15

Pictogram key to be used: 1 symbol = 10 trees

(a) Write down how many symbols should be drawn to represent School A. **(1)**

.....

(b) Write down how many symbols should be drawn to represent School B. **(1)**

.....

(c) Write down how many symbols should be drawn to represent School D. **(1)**

.....

(d) School C planted 60 trees. Explain why it is easier to draw an accurate pictogram symbol for School C than for School B. **(1)**

.....

.....

.....

(Total for Question 1 is 4 marks)

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2 Four pupils recorded how many books they read over the summer holiday. The pictogram shows the results.

Books read over the summer holiday

Pupil	Number of books read
Jack	
Aaliyah	
Kwame	
Grace	

Key:  = 4 books  = 2 books

(a) Write down the number of books read by Kwame. **(1)**

.....

(b) Work out the number of books read by Grace. **(2)**

.....

(c) Work out the total number of books read by all four pupils. **(2)**

.....

(Total for Question 2 is 5 marks)

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3 A pictogram shows the number of match-day programmes sold at a football ground over several games, but the key is missing. At Game 1, 6 symbols are shown, and this represents 60 programmes sold.

Programmes sold (key hidden)

Key: 	= ? programmes
Game 1	 = 60 programmes
Game 2	

(a) Work out the key for this pictogram (the number of programmes represented by 1 symbol). **(2)**

.....

(b) Use your key to work out the number of programmes sold at Game 2. **(2)**

.....

(Total for Question 3 is 4 marks)

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4 A pictogram shows the number of allotment plots growing different vegetables, using the key 1 symbol = 1 plot. Potatoes: 12 symbols. Carrots: 4 symbols. Beetroot: 3 symbols. Onions: 8 symbols.

(a) Write down the number of plots growing onions. **(1)**

.....

(b) Work out how many times as many plots grew potatoes as grew beetroot. **(2)**

.....

(c) Work out the total number of plots recorded. **(2)**

.....

(Total for Question 4 is 5 marks)

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5 A pictogram shows the number of cacti sold at a pop-up plant stall over four weeks, using the key 1 symbol = 5 cacti. Week 1: 2 symbols. Week 2: 3 symbols. Week 3: 4 symbols. Week 4: 5 symbols.

(a) Write down the number of cacti sold in Week 3. **(1)**

.....

(b) Describe the trend in the number of cacti sold over the four weeks. **(1)**

.....

(c) Assuming the trend continues, suggest the number of cacti that will be sold in Week 5. State the assumption you have made. **(2)**

.....

.....

.....

.....

.....

.....

.....

(Total for Question 5 is 4 marks)

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6 A pictogram is to be drawn showing raffle tickets sold by three tutor groups, using the key 1 symbol = 9 tickets (so a third-symbol = 3 tickets and a two-thirds-symbol = 6 tickets). 7Q sold 27 tickets. 7R sold 15 tickets. 7S sold 21 tickets.

(a) Write down how many symbols should be drawn to represent 7Q. **(1)**

.....

(b) Work out how many symbols (including any thirds) should be drawn to represent 7R. **(2)**

.....

(c) Work out how many symbols (including any thirds) should be drawn to represent 7S. **(2)**

.....

(Total for Question 6 is 5 marks)

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7 A sponsored fun run pictogram shows the money collected by four houses, but the key is missing. Oak: 5 symbols. Birch: 3 symbols. Willow: 2 symbols. Elm: 6 symbols. Together the four houses raised £800.

(a) Work out the amount of money represented by 1 symbol. **(2)**

.....

(b) Use your key to work out how much money Birch house raised. **(1)**

.....

(c) Work out how many more pounds Elm house raised than Willow house raised. **(2)**

.....

(Total for Question 7 is 5 marks)

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8 Each smiley face symbol represents 2 people. How many people are shown by 4 smiley faces?

(Total for Question 8 is 1 mark)

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9 In a pictogram each star symbol represents 5 apples. There are 3 stars shown. How many apples are there in total?

(Total for Question 9 is 1 mark)

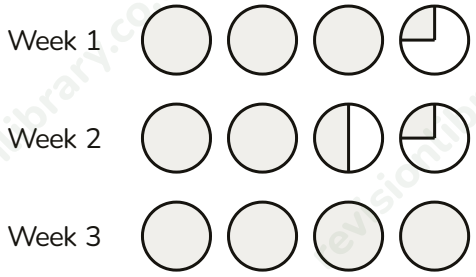
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10 Each recycling-bin symbol on a pictogram represents 4 boxes of recycling collected by a school's eco club. Work out how many boxes are represented by 5 recycling-bin symbols.

(Total for Question 10 is 1 mark)

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11 A weather station recorded the number of hours of sunshine over three weeks. The pictogram shows the results, with symbols split into quarters.



1 symbol = 8 hours
half symbol = 4 hours
quarter symbol = 2 hours

(a) Write down the number of hours of sunshine in Week 3. **(1)**

.....

(b) Work out the number of hours of sunshine in Week 1. **(2)**

.....

(c) Work out the total number of hours of sunshine over the three weeks. **(2)**

.....

(Total for Question 11 is 5 marks)

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12 A pictogram shows attendance at a football club's home matches, using the key 1 symbol = 100 spectators, with a quarter symbol representing 25. Match 1: 4 and a quarter symbols. Match 2: 3 and a half symbols. Match 3: 5 symbols. Match 4: 2 and three-quarter symbols. Match 5: 6 symbols.

(a) Write down the attendance at Match 3. **(1)**

.....

(b) Work out the attendance at Match 4. **(1)**

.....

(c) By rounding each match's attendance to the nearest 100, estimate the total attendance across the five matches. **(3)**

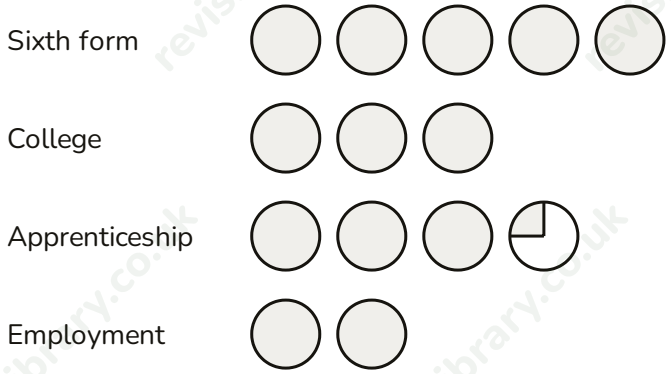
(d) Write down which match had the highest attendance. **(1)**

.....

(Total for Question 12 is 6 marks)

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13 The pictogram shows the number of Year 11 students choosing each post-16 pathway, using the key 1 symbol = 4 students. It was drawn by a pupil who intended the Apprenticeship row to represent 14 students, but has drawn 3 whole symbols plus one small quarter-symbol instead.



1 symbol = 4 students
half-symbol = 2 students
quarter-symbol = 1 student

(a) Using the key, work out how many symbols (including any half symbol) should have been drawn to correctly represent 14 students choosing Apprenticeship. **(2)**

(b) The pupil drew 3 whole symbols plus a quarter-symbol instead. Explain the pupil's mistake, and state how many students this incorrect drawing actually represents. **(2)**

(c) Using the correct value of 14 for Apprenticeship, work out the total number of students represented across all four pathways. **(2)**

(Total for Question 13 is 6 marks)

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14 A running club recorded members' preferred distance on a pictogram, using the key 1 symbol = 6 members. 5k: 4 symbols. 10k: 3 symbols. Half marathon: 1 symbol. Work out the ratio of members who prefer 5k to members who prefer 10k to members who prefer a half marathon. Give your ratio in its simplest form.

(Total for Question 14 is 3 marks)

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15 A pictogram uses the key 1 symbol = 6 people, with only whole, half and quarter symbols allowed. Explain why this pictogram could not show exactly that 16 people chose a particular activity.

.....

.....

(Total for Question 15 is 2 marks)

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16 In a pictogram each icon of a book represents 4 books. A library shows 5 full book icons and 1 half icon (half a symbol). How many books are represented?

(Total for Question 16 is 2 marks)

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17 A rescue centre's pictogram shows animals currently in its care. Each paw-print symbol represents 6 animals. The cats row shows 5 paw-print symbols and the dogs row shows 3 paw-print symbols.
Work out how many more cats than dogs are at the rescue centre.

(Total for Question 17 is 2 marks)

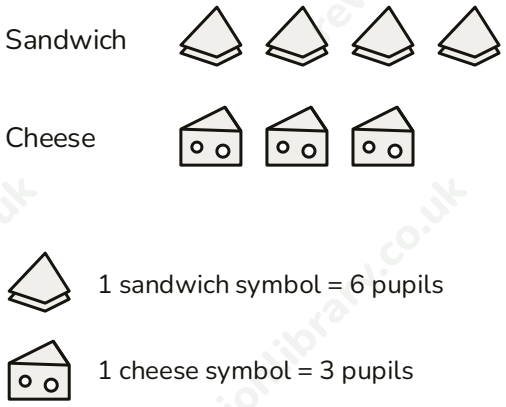
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18 A garden centre's pictogram shows plant pots sold each day. One plant-pot symbol represents 8 plant pots. Tuesday's row shows 4 full plant-pot symbols and 1 symbol that is three-quarters shaded.
Work out how many plant pots were sold on Tuesday.

(Total for Question 18 is 2 marks)

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19 A school pictogram shows lunch choices. One sandwich symbol represents 6 pupils. The diagram shows 4 sandwich symbols and 3 cheese symbols. Each cheese symbol represents 3 pupils.
Work out the total number of pupils shown who chose either a sandwich or cheese.



(Total for Question 19 is 3 marks)

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20 In a pictogram for a car park each car symbol represents 8 cars. There are 9 car symbols and 2 quarter symbols (each quarter symbol represents a quarter of one car symbol).
How many cars are represented?

(Total for Question 20 is 3 marks)

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21 A school bake sale pictogram shows cakes sold, with one cake symbol representing 5 cakes. The pictogram shows 3 symbols for sponge cakes, 4 symbols for flapjacks and 2 symbols for brownies.
Work out the total number of cakes sold.

(Total for Question 21 is 3 marks)

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22 A farmer uses a pictogram where one vegetable symbol represents 12 vegetables. The pictogram shows 5 carrot symbols, 3 potato symbols and 2 small quarter symbols (each quarter symbol represents 1/4 of a full symbol).

(a) Work out how many vegetable symbols in total are shown (counting quarters as fractions). **(1)**

.....

(b) Work out the total number of vegetables represented. **(3)**

.....

(Total for Question 22 is 4 marks)

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23 A pictogram shows pets owned by 60 pupils. Each pupil owns exactly one pet. Each paw print symbol represents the same number of pets. The pictogram shows: 6 paw prints for dogs, 8 paw prints for cats, 1 paw print for fish, and 5 paw prints for rabbits. All pets are shown.
Work out how many pets each paw print represents.

(Total for Question 23 is 4 marks)

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24 A charity poster uses one ribbon symbol to represent 25 donated items. The poster shows 2 full ribbons and 3 small slivers, each sliver representing 1/5 of a full symbol.
How many donated items are shown on the poster?

(Total for Question 24 is 4 marks)

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25 A pictogram shows visitors to a village show across three days. Each flag symbol represents the same number of visitors. Friday shows 4 symbols, Saturday shows 7 symbols and Sunday shows 5 symbols. The show had 480 visitors in total across the three days.
Work out how many visitors are represented by each flag symbol.

(Total for Question 25 is 4 marks)

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26 A library's summer reading challenge pictogram uses one book symbol to represent 6 books. Amara read 39 books during the challenge.
Work out how many full book symbols should be drawn on the pictogram, and state what fraction of a symbol is needed to represent the remaining books exactly.

(Total for Question 26 is 4 marks)

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Mark scheme · 1.13 Pictograms: 2-hour Pack

Question 1

(a) 4 (symbols) cao **B1**

(a) Answer: 4 symbols

(b) 2 and a half (symbols) cao, oe 2.5 **B1**

(b) Answer: 2.5 symbols

(c) 1 and a half (symbols) cao, oe 1.5 **B1**

(c) Answer: 1.5 symbols

(d) correct explanation that 60 is an exact multiple of the key (10), giving a whole number of symbols, whereas 25 is not, so a part symbol is needed, oe **B1**

(d) Answer: 60 is an exact multiple of 10 (the key), so School C needs a whole number of symbols (6); 25 is not an exact multiple of 10, so School B needs a part symbol (a half), which is harder to draw accurately.

Question 2

(a) 4 cao **B1**

(a) Answer: 4

(b) 4.5 x 4 oe **M1**

(b) 18 cao **A1**

(b) Answer: 18

(c) 3.5 + 2 + 1 + 4.5 (= 11 symbols), or 14 + 8 + 4 + 18, oe **M1**

(c) 44 cao **A1**

(c) Answer: 44

Question 3

(a) 60 / 6 oe **M1**

(a) 10 (programmes) cao **A1**

(a) Answer: 1 symbol = 10 programmes

(b) 4.5 x their key from (a) **M1**

(b) 45 cao (ft their key) **A1**

(b) Answer: 45

Question 4

(a) 8 cao **B1**

(a) Answer: 8

(b) 12 / 3 oe **M1**

(b) 4 cao **A1**

(b) Answer: 4

(c) 12 + 4 + 3 + 8 oe **M1**

(c) 27 cao **A1**

(c) Answer: 27

Question 5

(a) 20 cao **B1**

(a) Answer: 20

(b) sales increase by the same amount (one symbol, 5 cacti) each week oe **B1**

(b) Answer: Sales increase by 5 cacti (one symbol) every week.

(c) extends the pattern by a further 5, e.g. 25 + 5 oe **M1**

(c) 30, with a valid assumption stated (e.g. sales continue to increase at the same steady rate) **A1**

(c) Answer: 30 (assuming sales keep increasing at the same steady rate of 5 cacti per week)

Question 6

(a) 3 symbols cao **B1**

(a) Answer: 3 symbols

(b) 15 / 9 oe, e.g. 9 + 6 identified **M1**

(b) 1 and two-thirds symbols cao **A1**

(b) Answer: 1 and two-thirds symbols

(c) 21 / 9 oe, e.g. 18 + 3 identified **M1**

(c) 2 and one-third symbols cao **A1**

(c) Answer: 2 and one-third symbols

Question 7

(a) total symbols = 5 + 3 + 2 + 6 = 16 identified oe **M1**

(a) £50 cao **A1**

(a) Answer: £50

(b) 150 cao, ft their key **B1**

(b) Answer: £150

(c) Elm = 6 x 50 (=300) and Willow = 2 x 50 (=100) both identified, ft their key **M1**

(c) 200 cao **A1**

(c) Answer: £200

Question 8

8 cao **B1**

Answer: 8

Question 9

15 cao **B1**

Answer: 15 apples

Question 10

20 cao **B1**

Answer: 20 boxes

Question 11

(a) 32 cao **B1**

(a) Answer: 32

(b) 3.25 x 8 oe **M1**

(b) 26 cao **A1**

(b) Answer: 26

(c) 3.25 + 2.75 + 4 (= 10 symbols), x 8, oe, or 26 + 22 + 32 **M1**

(c) 80 cao **A1**

(c) Answer: 80

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Question 12

(a) 500 cao **B1**

(a) Answer: 500

(b) 275 cao **B1**

(b) Answer: 275

(c) rounds each attendance to the nearest 100: 400, 400, 500, 300, 600 oe **M1**

(c) sums the rounded values oe **M1**

(c) 2200 cao **A1**

(c) Answer: 2200

(d) Match 5 cao **B1**

(d) Answer: Match 5

Question 13

(a) 14 / 4 oe **M1**

(a) 3 and a half symbols cao **A1**

(a) Answer: 3 and a half symbols

(b) explains that a half-symbol (not a quarter-symbol) was needed for the remaining 2 students oe **B1**

(b) 13 cao **B1**

(b) Answer: The pupil should have drawn a half-symbol (2 students) for the remaining 2 students, not a quarter-symbol (1 student). As drawn, the row actually represents 3 x 4 + 1 = 13 students.

(c) 20 + 12 + 14 + 8 oe **M1**

(c) 54 cao **A1**

(c) Answer: 54

Question 14

24, 18 and 6 found (or the equivalent ratio 24:18:6) oe **M1**

divides each part of the ratio by a common factor of 6 oe **M1**

4:3:1 cao **A1**

Answer: 4:3:1

Question 15

recognises the smallest part-symbol (a quarter) represents 6/4 = 1.5 people, so any value shown must be a multiple of 1.5 oe **B1**

16 is not a multiple of 1.5 (16 / 1.5 = 10.67, not a whole number), so 16 cannot be shown exactly oe **B1**

Answer: Each quarter-symbol represents 6/4 = 1.5 people, so every value the pictogram can show must be a multiple of 1.5. Since 16 / 1.5 = 10.67 (not a whole number), 16 people cannot be represented exactly using whole, half and quarter symbols.

Question 16

Use of 5 full symbols x 4 and half symbol = 0.5 x 4 or 2, so method shown **M1**

22 cao **A1**

Answer: 22 books

Question 17

Correct method shown, e.g. (5 x 6) - (3 x 6) or 30 and 18 identified **M1**

12 cao **A1**

Answer: 12 more cats

Question 18

Recognise three-quarters symbol = 0.75 x 8 and show method, e.g. (4 x 8) + (0.75 x 8) **M1**

38 cao **A1**

Answer: 38 plant pots

Question 19

Correct calculation of sandwiches: 4 x 6 = 24 and cheeses: 3 x 3 = 9 (method shown) **M1**

Addition of the two totals shown, e.g. 24 + 9 **M1**

33 cao **A1**

Answer: 33 pupils

Question 20

Recognise 2 quarter symbols = 0.5 of a symbol and show method to convert to number of whole symbols **M1**

Calculate cars from full symbols: 9 x 8 and add half symbol 0.5 x 8 **M1**

76 cao **A1**

Answer: 76 cars

Question 21

Correct number of symbols identified for each type: 3, 4 and 2, or totals 15, 20 and 10 shown **M1**

Addition of all three totals shown, e.g. 15 + 20 + 10 **M1**

45 cao **A1**

Answer: 45 cakes

Question 22

(a) 5 + 3 + 2 x 1/4 = 8.5 shown **B1**

(a) Answer: 8.5 symbols

(b) Use total symbols 8.5 and multiply by 12, showing method **M1**

(b) Calculate 8.5 x 12 or 8 x 12 + 0.5 x 12 **M1**

(b) 102 cao **A1**

(b) Answer: 102 vegetables

Question 23

Sum symbols: 6 + 8 + 1 + 5 = 20 shown **M1**

Method to divide total pets by number of symbols: 60 / 20 **M1**

3 cao **A1**

State result as pets per paw print, e.g. '3 pets per paw print' oe **B1**

Answer: 3 pets per paw print

Question 24

Convert slivers to fraction of a symbol: 3 x 1/5 = 3/5 or 0.6 **M1**

Add to full ribbons: 2 + 3/5 shown as total symbols **M1**

Multiply total symbols by 25, or compute 2 x 25 + (3/5) x 25 **M1**

65 cao **A1**

Answer: 65 items

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Question 25

Sum of symbols found: 4 + 7 + 5 = 16 shown	**M1**
Method to divide total visitors by number of symbols: 480 / 16	**M1**
30 cao	**A1**
State result as visitors per symbol, e.g. '30 visitors per symbol' oe	**B1**

Answer: 30 visitors per symbol

Question 26

Method shown to divide total books by symbol value, e.g. 39 / 6	**M1**
6.5 or 6 and a half (oe) cao	**A1**
6 full symbols stated	**B1**
A half symbol (0.5 of a symbol) stated oe	**B1**

Answer: 6 full symbols and a half symbol (0.5 of a symbol)

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