KS3.M-S3 Bar Charts, Pictograms and Line Graphs

AQA KS3.M-S3 · Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A class counts the colours of 30 pencils. The results are: red 8, blue 7, green 9, yellow 6. Draw a vertical bar chart to show this data. Label the axes and give a suitable scale.

(2)

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2 A pictogram uses one symbol to represent 3 pets. Draw a pictogram for 9 dogs, 6 cats and 3 rabbits using that symbol. How many symbols do you draw for each pet type?

(2)

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3 Here is a small table of daily visitors to a farm shop over 4 days: Monday 24, Tuesday 30, Wednesday 18, Thursday 28. Complete the table by adding a column that shows the same data on a scale where 1 square = 6 visitors (for a pictogram). How many squares for each day?

(2)

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4 A line graph shows temperature at times during a day. At 6:00 the temperature is 8 degrees C, at 12:00 it is 15 degrees C, and at 18:00 it is 10 degrees C. Plot these points and join them with straight lines. What is the temperature at 9:00 if the graph shows a straight line between 6:00 and 12:00?

(2)

5 The bar chart shows how many books each pupil read in a month: Alice 5, Ben 2, Cara 4, David 3. Which pupil read the most books and how many more did they read than the pupil who read the fewest?

(2)

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6 A pictogram shows that 4 symbols represent 8 apples. How many apples does 1 symbol represent? Use your answer to find how many apples are shown by 7 symbols.

(2)

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7 The horizontal bar chart below shows the time (minutes) students spent reading each week: Emma 90, Faisal 60, Grace 120, Harry 30. Which student spent twice as long as Faisal reading?

(2)

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8 A line graph shows sales of ice creams over 5 days: Day 1 40, Day 2 55, Day 3 50, Day 4 60, Day 5 70. Between which two consecutive days was the biggest increase in sales and what was the increase?

(2)

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9 A bar chart shows how many minutes 5 friends spent on homework: Priya 45, Sam 30, Jodie 60, Tom 15, Zara 50. Work out the total number of minutes spent on homework by all five friends.

(2)

10 A pictogram shows the number of books read by 3 classes using a symbol worth 4 books. Class 7A shows 5 symbols, Class 7B shows 3 and a half symbols, Class 7C shows 2 symbols. How many books did each class read?

(2)

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11 A line graph tracks the number of visitors to a museum over 4 hours: 10:00 - 20, 11:00 - 35, 12:00 - 50, 13:00 - 30. Between which two consecutive hours did the number of visitors decrease, and by how much?

(3)

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12 A bar chart shows the number of goals scored by four football teams in a season: Reds 18, Blues 24, Greens 12, Yellows 30. Which team scored the fewest goals, and what fraction of the total goals scored by all four teams did they score? Give your answer in simplest form.

(3)

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13 A pictogram uses a symbol representing 5 sweets. If a row shows 2 and 3/5 symbols, how many sweets does this represent?

(2)

14 A line graph shows the distance a cyclist has travelled: at 0 minutes the distance is 0 km, and at 20 minutes the distance is 5 km. Assuming a constant speed shown by a straight line, what distance had the cyclist travelled after 12 minutes?

(3)

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15 Two bar charts compare rainfall (mm) in April and May for a town: April - Week 1 12, Week 2 8, Week 3 20, Week 4 10; May - Week 1 15, Week 2 18, Week 3 9, Week 4 22. Which week had the greatest combined rainfall (April + May), and what was the combined total for that week?

(3)

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16 A horizontal bar chart shows the population (thousands) of four towns: Ashby 45, Barton 60, Crossfield 38, Denby 52. List the towns in order from smallest to largest population.

(2)

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17 A line graph shows a car's fuel level (litres) during a journey: at 0 km the fuel is 40 litres, and at 100 km the fuel is 25 litres. Assuming the graph is a straight line, estimate the fuel level after 60 km.

(3)

18 Stretch question. A pictogram shows sales of umbrellas over 4 days using a symbol worth 6 umbrellas: Monday 2 symbols, Tuesday 3 and a half symbols, Wednesday 1 symbol, Thursday 4 symbols. Work out the number of umbrellas sold each day, the total sold over the 4 days, and, if Friday's sales were double Thursday's, how many umbrellas were sold on Friday.

(4)

Mark scheme · KS3.M-S3 Bar Charts, Pictograms and Line Graphs

Question 1

- **M1** vertical bars drawn with correct heights for all four categories (heights 8, 7, 9, 6) and bars labelled
- **A1** axes labelled and a sensible scale shown (e.g. 0 to 10 with ticks at 1 or 2) cao
- Answer: **Bar chart with bars heights 8,7,9,6; axes labelled; scale 0 to 10 with ticks**

Question 2

- **M1** correct number of symbols shown for each type: dogs 3, cats 2, rabbits 1
- **A1** symbols drawn or numbers stated clearly cao
- Answer: **Dogs 3 symbols, Cats 2 symbols, Rabbits 1 symbol**

Question 3

- **M1** correct conversion to squares for whole-square answers: 24 -> 4, 30 -> 5, 18 -> 3, 28 -> 4 with any fractional representation noted
- **A1** clear counts given as 4, 5, 3, and 4 (or 4 and 2/3 clearly stated) cao
- Answer: **Monday 4, Tuesday 5, Wednesday 3, Thursday 4 (28 is 4 and 2/3 squares if representing exact)**

Question 4

- **M1** correct plotting of given points and indication of straight line between 6:00 and 12:00
- **A1** temperature at 9:00 = 11.5 degrees C cao
- Answer: **11.5 degrees C**

Question 5

- **M1** identifies Alice as having the most with 5 books
- **A1** difference 3 (5 - 2) cao
- Answer: **Alice read the most with 5 books; 3 more than Ben**

Question 6

- **M1** method: 8 divided by 4 = 2 apples per symbol
- **A1** 7 symbols represent 14 apples cao
- Answer: **2 apples per symbol; 7 symbols = 14 apples**

Question 7

- **M1** method shown or stated: Faisal 60 x 2 = 120 or equivalent calculation
- **A1** identifies Grace as twice as long as Faisal (Grace 120 minutes) cao
- Answer: **Grace**

Question 8

- **M1** correct identification of the pair with the largest difference (Day 1 to Day 2 is +15 and Day 4 to Day 5 is +10, so Day 1 to Day 2)
- **A1** increase 15 cao
- Answer: **Biggest increase Day 1 to Day 2; increase 15**

Question 9

- **M1** method: 45 + 30 + 60 + 15 + 50 shown
- **A1** 200 minutes cao
- Answer: **200 minutes**

Question 10

- **M1** method: multiply number of symbols by 4 for each class
- **A1** 7A = 20, 7B = 14, 7C = 8 cao
- Answer: **7A 20 books, 7B 14 books, 7C 8 books**

Question 11

- **M1** finds the change between each consecutive pair of hours
- **M1** identifies 12:00 to 13:00 as the only decrease
- **A1** decrease of 20 visitors cao
- Answer: **12:00 to 13:00; decrease of 20 visitors**

Question 12

- **M1** identifies Greens as fewest with 12 goals
- **M1** method: total goals = 18 + 24 + 12 + 30 = 84 and forms fraction 12/84
- **A1** 1/7 cao
- Answer: **Greens; 1/7**

Question 13

- **M1** method: 2.6 x 5 or equivalent shown
- **A1** 13 sweets cao
- Answer: **13 sweets**

Question 14

- **M1** method: rate = 5 km / 20 min = 0.25 km per minute
- **M1** method: 0.25 x 12 shown
- **A1** 3 km cao
- Answer: **3 km**

Question 15

- **M1** method: adds April and May for each week (27, 26, 29, 32)
- **M1** identifies Week 4 as the greatest combined total
- **A1** 32 mm cao
- Answer: **Week 4; 32 mm**

Question 16

- **M1** method: compares all four values
- **A1** Crossfield, Ashby, Denby, Barton cao
- Answer: **Crossfield, Ashby, Denby, Barton**

Question 17

- **M1** method: fuel used = 15 litres over 100 km = 0.15 litres per km
- **M1** method: 40 - (0.15 x 60) shown
- **A1** 31 litres cao
- Answer: **31 litres**

Question 18

- **M1** correct daily totals: Monday 12, Tuesday 21, Wednesday 6, Thursday 24
- **M1** total over 4 days = 63
- **M1** method: Friday = 2 x 24 shown
- **A1** Friday = 48 umbrellas cao
- Answer: **Daily: Mon 12, Tue 21, Wed 6, Thu 24; total 63; Friday 48**