# Full paper B1

Paper 1 style · Non-calculator · Foundation

**80** marks
1 hour 30 minutes

| Name | Date | Score / 80 |
|---|---|---|
| | | |

**Answer ALL questions.** Write your answers in the spaces provided. You must write down all the stages in your working. You must **not** use a calculator. Diagrams are **NOT** accurately drawn unless it says so.

**Help on the longer questions**

**Underlined words** tell you what the question wants.

**Remember** reminds you of a fact you need.

**1** **Write** 40% as a decimal.

.....

**(1)**

**(Total for Question 1 is 1 mark)**

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**2** Here are the first four odd numbers.

1 3 5 7

**Find** the 10th odd number.

.....

**(1)**

**(Total for Question 2 is 1 mark)**

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**3** **Change** 23 centimetres into millimetres.

..... millimetres

**(1)**

**(Total for Question 3 is 1 mark)**

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**4** **Write down** the multiple of 6 that is between 40 and 45

.....

**(1)**

**(Total for Question 4 is 1 mark)**

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**5** **Work out** 700 + 268

.....

**(1)**

**(Total for Question 5 is 1 mark)**

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**6** Tom hires a bike for 6 days.
He pays £18 for each day.
He also pays £15 for a helmet.
Tom pays with three £50 notes.
**Work out** how much change he should get.

> **Remember** Change = money paid − total cost. Add up all the costs first.

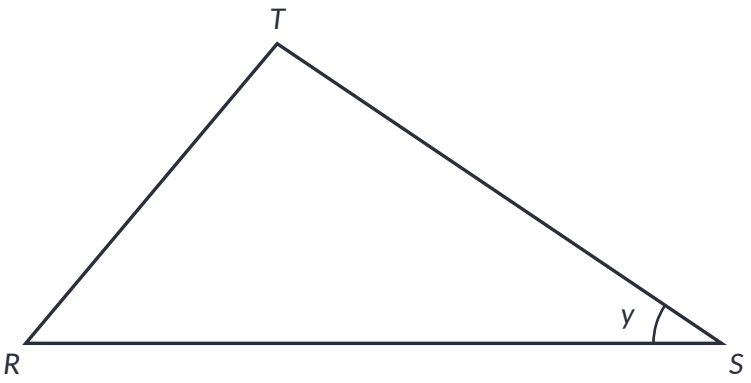
£ .....

**(3)**

**(Total for Question 6 is 3 marks)**

**7** ✎ **Complete this question on paper (printed at actual size)**

Here is an accurately drawn triangle.




**Remember** Line up 0 on the ruler. Put the protractor centre on the corner and count from 0°. Acute < 90°, obtuse between 90° and 180°.

**(a)** **Measure** the length of the side *RS*.
**Give your answer in centimetres**.

..... centimetres

**(1)**

**(b)** What type of angle is the angle marked *y*?

.....

**(1)**

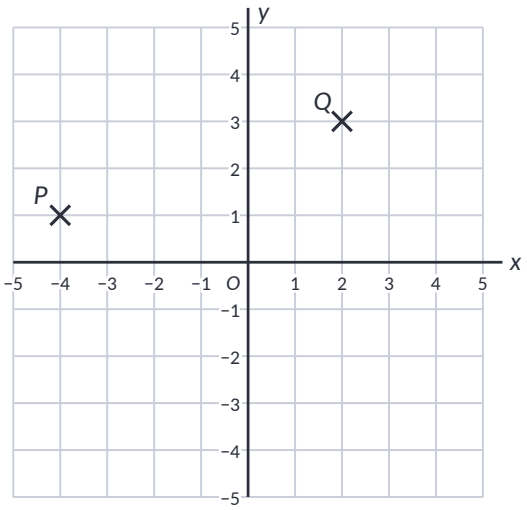
**(c)** **Measure** the size of the angle marked *y*.

..... °

**(1)**

**(Total for Question 7 is 3 marks)**

**8**




**Remember** (x, y): go along first, then up. Midpoint: add the x values and halve, add the y values and halve.

**(a)** **Write down** the coordinates of point *Q*.

**(1)**

**(b)** On the grid, mark with a cross (×) the point (−2, −3)
Label this point *R*.

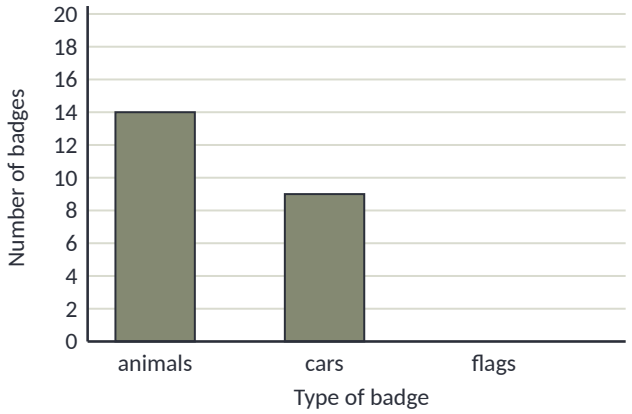
**(1)**

**(c)** **Write down** the coordinates of the midpoint of *PQ*.

**(1)**

**(Total for Question 8 is 3 marks)**

**9** Ali collects badges.
He only has animal badges, car badges and flag badges.
The incomplete bar chart shows some information about the number of badges Ali has.




Ali has a total of 35 badges.

**Remember** Check the scale on the axis: what does one square stand for? Label bars and use a ruler.

**(a)** **Complete** the bar chart.

**(3)**

**(b)** What fraction of the 35 badges are animal badges?
Give your fraction **in its simplest form**.

.....

**(2)**

**(c)** Beth also collects badges.
She only has red badges and blue badges.
For Beth's badges,

the number of red badges : the number of blue badges = 7 : 4

**Write down** the fraction of Beth's badges that are red.

.....

**(1)**

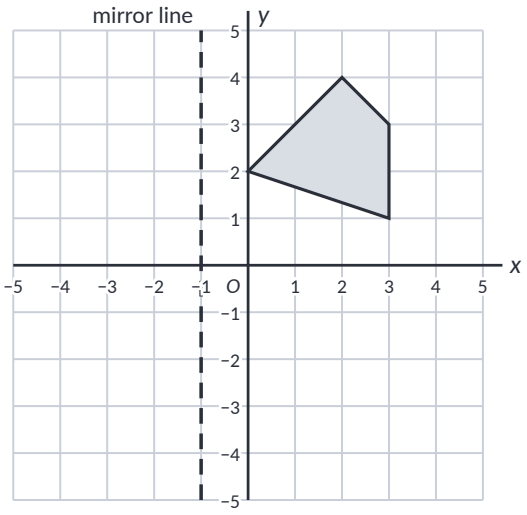
**(d)** **Write** the ratio 7 : 4 in the form $n$ : 1

.....

**(1)**

**(Total for Question 9 is 7 marks)**

**10**




**Remember** Each point moves to the same distance on the other side of the mirror line. x = a is vertical, y = a is horizontal.

**(a)** On the grid, reflect the shaded shape in the mirror line.

**(2)**

**(b)** **Write down** the equation of the mirror line.

.....

**(1)**

**(Total for Question 10 is 3 marks)**

**11** 400 people were asked what drink they liked best.
240 of the 400 people were adults.
90 of the adults said they liked coffee best.
70 of the children said they liked juice best.
130 of the people said they liked coffee best.
150 of the people said they liked tea best.

> **Remember** Rows and columns add up to the totals. Fill in the easy gaps first, then use them to find the rest.

**(a)** **Complete** the two-way table.

| | Tea | Coffee | Juice | Total |
|---|---|---|---|---|
| **Adults** | | | | |
| **Children** | | | | |
| **Total** | | | | 400 |

**(3)**

**(b)** One of these 400 people is chosen at random.
**Find** the probability that this person is a child who said they liked tea best.

.....

**(2)**

**(Total for Question 11 is 5 marks)**

**12** Mia was asked to work out $20 - 8 \div 2$
Mia wrote $20 - 8 = 12$
She then worked out $12 \div 2$
**Explain** what is wrong with Mia's method.

**(1)**

**(Total for Question 12 is 1 mark)**

**13** Here is a number machine.




**Remember** Go forwards through the machine for the output. To find the input, work backwards using the inverse (× becomes ÷).

**(a)** **Find** the output when the input is 9

.....

**(2)**

**(b)** Here is a different number machine.




When the input is 20, the output is 13
**Complete** this number machine.

**(2)**

**(Total for Question 13 is 4 marks)**

**14** Here is a cuboid of length 8 cm and width 5 cm.

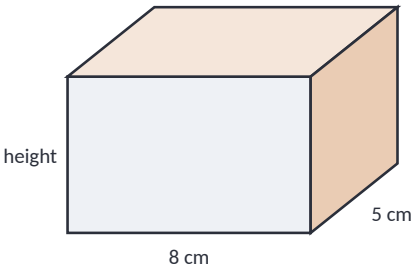



Diagram NOT accurately drawn

**Remember** Volume of a cuboid = length × width × height. Make all the units the same first (1 m = 100 cm).

**(a)** The cuboid has a volume of 160 $cm^3$
**Work out** the height of the cuboid.

..... cm

**(2)**

**(b)** Here is a different cuboid.

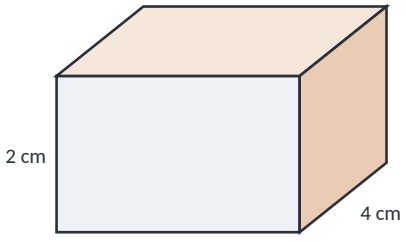



Diagram NOT accurately drawn

**Work out** the total surface area of this cuboid.

..... $cm^2$

**(3)**

**(Total for Question 14 is 5 marks)**

**15**

> **Remember** Expand: multiply every term inside the bracket. Factorise: take out the highest common factor. Quadratics: two numbers that multiply to the last term and add to the middle.

**(a)** **Factorise** $8b + 20$

.....

**(1)**

**(b)** **Solve** $5(2y - 3) = 45$

$y =$ .....

**(3)**

**(Total for Question 15 is 4 marks)**

---

**16** 1 cake and 1 juice cost £3.80

4 cakes and 1 juice cost £9.20

**Work out** the total cost of 3 cakes and 5 juices.

**You must show all your working**.

> **Remember** Use the first fact to find the cost of one item, then use it in the second fact.

£ .....

**(5)**

**(Total for Question 16 is 5 marks)**

**17** Gemma wants to make 20 litres of purple paint.

She is going to mix red paint, blue paint and white paint in the ratio 3 : 5 : 2

She has

7 litres of red paint

9 litres of blue paint

4 litres of white paint.

Does Gemma have enough red paint, blue paint and white paint to make 20 litres of purple paint?

**You must show how you get your answer**.

> **Remember** Add the ratio parts to find the total number of parts. One part = amount ÷ total parts. Then multiply.

**(3)**

**(Total for Question 17 is 3 marks)**

---

**18** **Work out** 643.5 ÷ 1.5

> **Remember** Line up the digits. To divide by a decimal, multiply both numbers by 10 (or 100) first. Check with an estimate.

.....

**(3)**

**(Total for Question 18 is 3 marks)**

---

**19** The table shows the probabilities that a biased dice will land on 3, on 4, on 5 and on 6

| Number on dice | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Probability | | | 0.2 | 0.15 | 0.25 | 0.1 |

Ella assumes that the probabilities that the dice will land on 1 and on 2 are the same.
Ella rolls the biased dice 400 times.

**Remember** Estimated number = probability × number of trials. The probabilities add up to 1.

**(a)** Assuming Ella is right, work out an estimate for the number of times the dice will land on 1

.....

**(3)**

**(b)** Ella is wrong.
The probability that the dice will land on 1 is less than the probability that the dice will land on 2
How does this information affect your answer to part (a)?

**(1)**

**(Total for Question 19 is 4 marks)**

**20**

**Remember** Add/subtract: make the denominators the same. Multiply: top × top, bottom × bottom. Divide: flip the second fraction and multiply. Change mixed numbers to top-heavy first.

**(a)** **Work out** $4\frac{3}{4} - 2\frac{1}{3}$
Give your answer **as a mixed number**.

.....

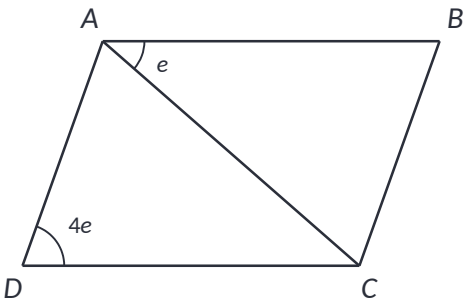
**(2)**

**(b)** **Show that** $3\frac{1}{3} \div 1\frac{1}{4} = 2\frac{2}{3}$

**(3)**

**(Total for Question 20 is 5 marks)**

**21** *ABCD* is a parallelogram.




All angles are measured in degrees.
**Find** an expression, **in terms of *e***, for the size of angle *CAD*.
**Give a reason for each stage of your working**.

> **Remember** Alternate angles are equal (Z). Corresponding angles are equal (F). Co-interior angles add up to 180° (C). Name the rule you use.

.....

**(3)**

**(Total for Question 21 is 3 marks)**

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**22** A bus travelled 8.13 miles at an average speed of 39.6 miles per hour.

> **Remember** Round every number to 1 significant figure first, then work it out. Say if you rounded up or down.

**(a)** **Work out** an estimate for the time taken by the bus.
**Give your answer in minutes**.

..... minutes

**(3)**

**(b)** Is your answer to part (a) an underestimate or an overestimate?
**Give a reason for your answer**.

**(1)**

**(Total for Question 22 is 4 marks)**

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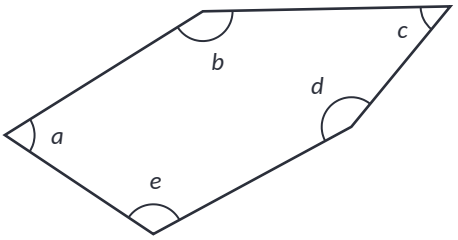
**23** Here is a pentagon.




Angle $a$ = angle $c$
Angle $b$ = 148°
Angle $d$ is three times the size of angle $c$
Angle $e$ is two times the size of angle $c$
**Work out** the size of angle $a$.

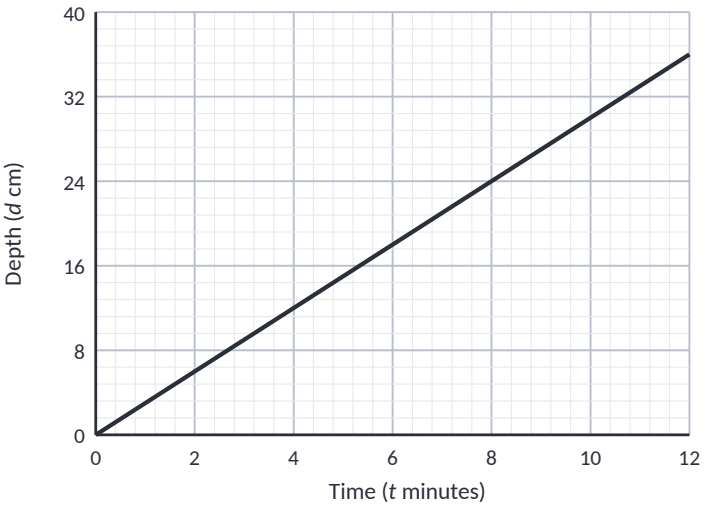
> **Remember** Sum of interior angles = (n − 2) × 180°. Exterior angles add up to 360°. Interior + exterior = 180°.

.....°

**(4)**

**(Total for Question 23 is 4 marks)**

**24** The graph shows the depth of water, $d$ cm, in a bath at time $t$ minutes.




What does the gradient of this graph represent?

**(1)**

**(Total for Question 24 is 1 mark)**

**25** **Make *p* the subject** of the formula $y = 5p + 8$

.....

**(2)**

**(Total for Question 25 is 2 marks)**

**26** **Solve** $x^2 + x - 12 = 0$

> **Remember** Expand: multiply every term inside the bracket. Factorise: take out the highest common factor. Quadratics: two numbers that multiply to the last term and add to the middle.

.....

**(3)**

**(Total for Question 26 is 3 marks)**

**TOTAL FOR PAPER IS 80 MARKS**

# B1 mark scheme

| Q | | Answer | Mark | Notes |
|---|---|---|---|---|
| 1 | | 0.4 | B1 | |
| 2 | | 19 | B1 | |
| 3 | | 230 | B1 | |
| 4 | | 42 | B1 | |
| 5 | | 968 | B1 | |
| 6 | | 27 | M1<br>M1<br>A1 | M1 for $6 \times 18$ (= 108)<br>M1 for $150 - (108 + 15)$<br>A1 cao |
| 7 | (a) | 9.2 | B1 | Accept 9.0 to 9.4 |
| | (b) | acute | B1 | |
| | (c) | 34 | B1 | Accept 32 to 36 |
| 8 | (a) | (2, 3) | B1 | |
| | (b) | Cross at (−2, −3) labelled R | B1 | |
| | (c) | (−1, 2) | B1 | |
| 9 | (a) | Bar for flags drawn at 12 | M1<br>A1<br>B1 | M1 for $35 - 14 - 9$<br>A1 for 12<br>B1 for a bar drawn at their value |
| | (b) | $\frac{2}{5}$ | M1<br>A1 | M1 for $\frac{14}{35}$<br>A1 cao |
| | (c) | $\frac{7}{11}$ | B1 | |
| | (d) | 1.75 : 1 | B1 | |



Mark scheme continues ►

| Q | | Answer | Mark | Notes |
|---|---|---|---|---|
| 10 | (a) | Shape at (−2, 2), (−4, 4), (−5, 3), (−5, 1) | B2 | B2 (B1 for 3 vertices correct or a correct reflection in another vertical line) |
| | (b) | $x = -1$ | B1 | |
| 11 | (a) | Adults: 100, 90, 50, 240<br>Children: 50, 40, 70, 160<br>Total: 150, 130, 120, 400 | B3 | B3 all correct (B2 for 6 correct, B1 for 4 correct) |
| | (b) | $\frac{50}{400}$ | M1<br>A1 | M1 ft from table<br>A1 oe |
| 12 | | She should divide first: 8 ÷ 2 = 4, then 20 − 4 = 16 | C1 | C1 |
| 13 | (a) | 15 | M1<br>A1 | M1 for 9 − 4 (= 5)<br>A1 cao |
| | (b) | + 6 | M1<br>A1 | M1 for 13 × 2 (= 26)<br>A1 for + 6 |
| 14 | (a) | 4 | M1<br>A1 | M1 for 160 ÷ (8 × 5)<br>A1 cao |
| | (b) | 100 | M1<br>M1<br>A1 | M1 for one face area (28, 14 or 8)<br>M1 for 2 × (28 + 14 + 8)<br>A1 cao |
| 15 | (a) | $4(2b + 5)$ | B1 | |
| | (b) | 6 | M1<br>M1<br>A1 | M1 for expanding $(10y - 15)$ or dividing by 5 $(2y - 3 = 9)$<br>M1 for $2y = 12$<br>A1 cao |
| 16 | | 15.40 | M1<br>M1<br>M1<br>M1<br>A1 | M1 for 9.20 − 3.80 (= 5.40, the cost of 3 cakes)<br>M1 for 5.40 ÷ 3 (= 1.80)<br>M1 for 3.80 − 1.80 (= 2.00)<br>M1 for 3 × 1.80 + 5 × 2.00<br>A1 cao |
| 17 | | No, she needs 10 litres of blue paint but only has 9 | M1<br>M1<br>C1 | M1 for 20 ÷ 10 (= 2)<br>M1 for 6, 10 and 4<br>C1 No, not enough blue |
| 18 | | 429 | M1<br>M1<br>A1 | M1 for 6435 ÷ 15 or equivalent<br>M1 for a complete method<br>A1 cao |



Mark scheme continues ►

| Q | | Answer | Mark | Notes |
|---|---|---|---|---|
| 19 | (a) | 60 | M1<br>M1<br>A1 | M1 for 1 − (0.2 + 0.15 + 0.25 + 0.1) (= 0.3)<br>M1 for 0.3 ÷ 2 × 400<br>A1 cao |
| | (b) | The estimate in (a) is too high (it should be less than 60) | C1 | C1 |
| 20 | (a) | $2\frac{5}{12}$ | M1<br>A1 | M1 for a common denominator of 12<br>A1 cao |
| | (b) | $\frac{10}{3} \times \frac{4}{5} = \frac{40}{15} = 2\frac{2}{3}$ | M1<br>M1<br>A1 | M1 for $\frac{10}{3}$ and $\frac{5}{4}$<br>M1 for multiplying by $\frac{4}{5}$<br>A1 for $\frac{40}{15}$ or $\frac{8}{3}$ and $2\frac{2}{3}$ |
| 21 | | $180 - 5e$ | B1<br>M1<br>C1 | B1 angle $ACD = e$ (alternate angles are equal)<br>M1 for $180 - 4e - e$<br>C1 angles in a triangle add up to 180° |
| 22 | (a) | 12 | M1<br>M1<br>A1 | M1 for rounding to 8 and 40<br>M1 for 8 ÷ 40 (= 0.2 hours)<br>A1 cao |
| | (b) | Underestimate: the distance was rounded down and the speed was rounded up | C1 | C1 |
| 23 | | 56 | M1<br>M1<br>M1<br>A1 | M1 for (5 − 2) × 180 (= 540)<br>M1 for 540 − 148 (= 392)<br>M1 for 392 ÷ 7<br>A1 cao |
| 24 | | The rate at which the depth of water increases (cm per minute) | C1 | C1 |
| 25 | | $p = \frac{y - 8}{5}$ | M1<br>A1 | M1 for $y - 8 = 5p$<br>A1 oe |
| 26 | | $x = 3, x = -4$ | M1<br>A1<br>A1 | M1 for $(x \pm 3)(x \pm 4)$<br>A1 for $(x - 3)(x + 4)$<br>A1 for both values |

**B1** = mark for a correct answer · **M1** = method mark · **A1** = accurate answer after M1 · **C1** = reason · **cao** = correct answer only

**Score ____ / 80**



**Write your score on the front page**