# Full paper D1

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** Here is a list of numbers.

3 9 5 5 11

**Work out** the range of these numbers.

.....

**(1)**

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

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**2** **Work out** 150 − 76

.....

**(1)**

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

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**3** **Simplify** $5 \times b \times 2$

.....

**(1)**

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

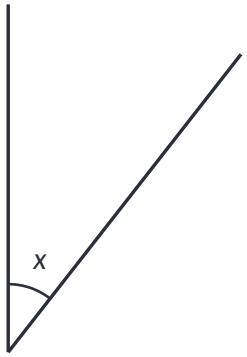
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**Turn over ►**

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

**Measure** the size of the angle marked $x$.




..... °

**(1)**

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

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**5** **Work out** $\frac{1}{4}$ of 200

.....

**(1)**

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

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**6** There are 2 litres of milk in a bottle.
Ollie uses 650 millilitres of the milk.
**Work out** the amount of milk left in the bottle.
**Give your answer in millilitres**.

> **Remember** 1 kg = 1000 g. 1 litre = 1000 ml. 1 m = 100 cm. 1 cm = 10 mm. 1 km = 1000 m.

..... millilitres

**(3)**

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

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**7** Priya is drawing a scale diagram.

1 cm represents 4 m.

**(a)** Priya draws a line 6 cm long.
What real distance does the line represent?

..... m

**(1)**

**(b)** The real distance between two points is 28 m.
What is the distance between the two points on the scale diagram?

..... cm

**(1)**

**(Total for Question 7 is 2 marks)**

**8** Mr Khan asked 24 students which fruit they liked best.
Here are the results.

| | | | |
|---|---|---|---|
| apple | orange | orange | banana |
| apple | banana | orange | orange |
| apple | orange | banana | banana |
| apple | apple | apple | banana |
| apple | banana | apple | apple |
| orange | banana | apple | banana |

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

**(a)** **Complete** the frequency table.

| Fruit | Tally | Frequency |
|---|---|---|
| apple | | |
| banana | | |
| orange | | |

**(2)**

**(b)** **Write down** the fruit that is the mode.

.....

**(1)**

**(c)** **Draw** a bar chart to show the results.



**(3)**

**(Total for Question 8 is 6 marks)**

**9** There are 25 counters in a bag.
6 of the counters are green.
11 of the counters are yellow.
8 of the counters are orange.
Ruby takes at random a counter from the bag.
**Write down** the probability that Ruby

> **Remember** Probabilities add up to 1. P(event) = number of ways it can happen ÷ total number of outcomes. AND means multiply.

**(a)** takes a yellow counter,

.....

**(1)**

**(b)** does **not** take an orange counter,

.....

**(1)**

**(c)** takes a purple counter.

.....

**(1)**

**(Total for Question 9 is 3 marks)**

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**10** Here are the ingredients needed to make 15 muffins.

| **Makes 15 muffins** |
|---|
| 180 g flour |
| 120 g butter |
| 3 eggs |

Dan wants to make 45 muffins.
He has 500 g of flour.
Does Dan have enough flour to make 45 muffins?
**You must show how you get your answer**.

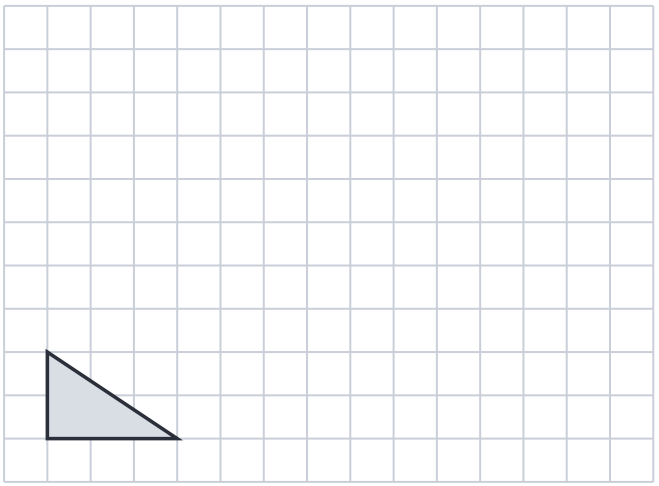
> **Remember** Find the value for 1 first (÷), then multiply. Inverse proportion: more workers → less time (× then ÷).

**(3)**

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

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**11**



On the grid, draw an enlargement of the triangle with a scale factor of 2

**(2)**

**(Total for Question 11 is 2 marks)**

**12** $P = 3m + 2n$

**Remember** Put the numbers in place of the letters, using brackets for negatives. Then follow BIDMAS.

**(a)** **Work out** the value of $P$ when $m = 4$ and $n = 5$

$P =$ .....

**(2)**

**(b)** **Work out** the value of $m$ when $P = 41$ and $n = 7$

$m =$ .....

**(2)**

**(c)** $W = 4a - b$

**Work out** the value of $W$ when $a = -2$ and $b = 3$

$W =$ .....

**(2)**

**(Total for Question 12 is 6 marks)**

**13** Holly is making keyrings.
Holly has a large number of metal rings.
Each metal ring costs 12p.
She buys 60 g of beads for £2.40
Holly uses 1 metal ring and 4 g of beads to make each keyring.
She makes as many keyrings as she can.
**Work out** the total cost of each keyring that she makes.
**Give your answer in pence**.

> **Remember** Write down each cost or amount as you work it out, then add them up. Write money with 2 decimal places (£4.50). 100p = £1.

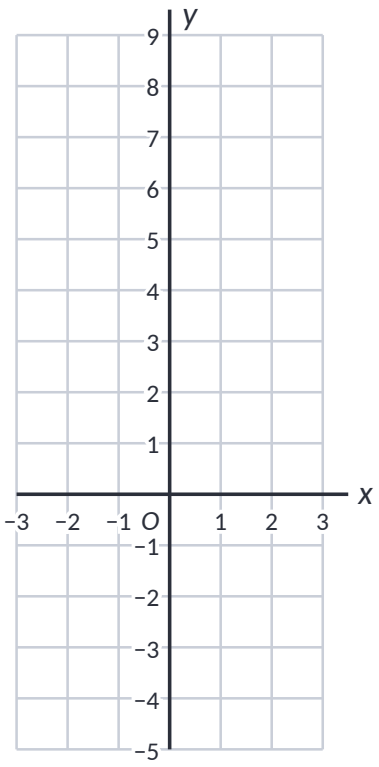
.....p

**(4)**

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

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**14** On the grid, draw the graph of $y = 3x + 2$ for values of $x$ from −2 to 2




> **Remember** y = mx + c: m is the gradient (up ÷ across), c is where the line crosses the y-axis.

**(3)**

**(Total for Question 14 is 3 marks)**

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**15** Amara is buying a car.
The car costs £9600
Amara pays 15% of the cost as a deposit.
She pays the rest of the cost in 24 equal monthly payments.
How much is each monthly payment?

> **Remember** Fraction of an amount: ÷ by the bottom, × by the top. Percentage: 10% = ÷ 10, 1% = ÷ 100, or use a multiplier (35% = 0.35).

£ .....

**(4)**

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

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**16** Kim takes a test.
The test is out of 80 marks.
Kim needs to score at least 65% of the marks to pass the test.
She scores 53 marks.
**Show that** Kim passes the test.

**(2)**

**(Total for Question 16 is 2 marks)**

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**17** **Work out** $\frac{4}{7} \div \frac{1}{3}$
Give your answer **as a mixed number**.

> **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.

.....

**(3)**

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

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**18** **Work out** $5.2 \times 3.7$

> **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)**

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**19**

> **Remember** Multiply: add the powers. Divide: subtract the powers. Power of a power: multiply the powers. Anything to the power 0 = 1.

**(a)** **Write down** the value of $8^0$

.....

**(1)**

**(b)** **Write down** the value of $4^{-2}$

.....

**(1)**

**(c)** **Write** $\frac{3^6 \times 3^4}{3^5}$ in the form $3^n$ where $n$ is an integer.

.....

**(2)**

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

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**20**

**Remember** Use a factor tree. HCF = the primes both numbers share. LCM = the smallest number in both times tables.

**(a)** **Write** 180 as a product of its prime factors.

.....

**(2)**

**(b)** **Find** the highest common factor (HCF) of 180 and 150

.....

**(2)**

**(Total for Question 20 is 4 marks)**

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**21** The mean weight of 6 parcels is 3.5 kg.
Lewis weighed one of the parcels as 6 kg.

**Remember** Mean = total ÷ how many. Median = middle value when in order. Mode = most common. Range = biggest − smallest.

**(a)** **Work out** the mean weight of the other 5 parcels.

..... kg

**(3)**

**(b)** Lewis made a mistake.
The parcel was not 6 kg.
It was 9 kg.
How does this affect your answer to part (a)?

**(1)**

**(Total for Question 21 is 4 marks)**

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

The point $P$ lies on the line $AB$.

**Use ruler and compasses** to construct an angle of 90° at $P$.

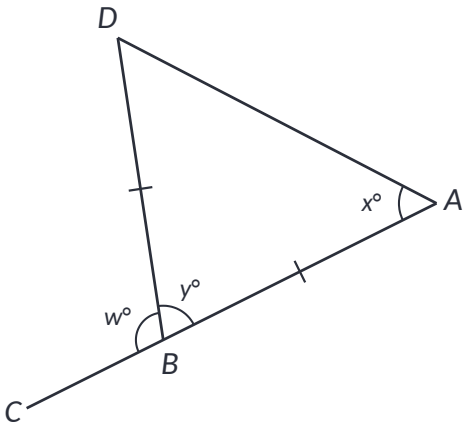
You must show all your construction lines.




**(2)**

**(Total for Question 22 is 2 marks)**

**23** The diagram shows an isosceles triangle $ABD$ and the straight line $ABC$.




$BA = BD$

$x : y = 3 : 4$

**Work out** the value of $w$.

> **Remember** Straight line = 180°. Around a point = 360°. Triangle = 180°. Quadrilateral = 360°. Isosceles: two equal base angles. Write the reason for each angle.

$w =$ .....

**(4)**

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

**24** Ella has three boxes of pens.
There are $x$ pens in box **A**.
There are $(2x + 3)$ pens in box **B**.
There are $(x - 1)$ pens in box **C**.
There is a total of 34 pens in the three boxes.
All the pens have the same mass.
The pens in box **B** have a total mass of 285 g.
**Work out** the total mass of the pens in box **A**.

> **Remember** Do the same to both sides. Undo + with −, undo × with ÷. Expand brackets first.

..... g

**(5)**

**(Total for Question 24 is 5 marks)**

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**25** A piece of metal has a mass of 54 g and a volume of 20 $cm^3$
**Work out** the density of the piece of metal.

..... $g/cm^3$

**(2)**

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

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**26** **Work out** an estimate for $\frac{6.8 \times 3.9}{0.48}$

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

.....

**(3)**

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

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**27**

> **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)** **Expand and simplify** $(2x + 3)(x - 4)$

.....

**(2)**

**(b)** **Factorise** $x^2 - 25$

.....

**(1)**

**(Total for Question 27 is 3 marks)**

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**TOTAL FOR PAPER IS 80 MARKS**

# D1 mark scheme

| Q | | Answer | Mark | Notes |
|---|---|---|---|---|
| 1 | | 8 | B1 | |
| 2 | | 74 | B1 | |
| 3 | | 10*b* | B1 | |
| 4 | | 38 | B1 | Accept 36 to 40 |
| 5 | | 50 | B1 | |
| 6 | | 1350 | M1<br>M1<br>A1 | M1 for 2 litres = 2000 ml<br>M1 for 2000 − 650<br>A1 cao |
| 7 | (a) | 24 | B1 | |
| | (b) | 7 | B1 | |
| 8 | (a) | apple 10, banana 8, orange 6 | B2 | B2 all correct (B1 for 2 correct) |
| | (b) | apple | B1 | B1 ft |
| | (c) | Bar chart with bars at 10, 8, 6, labelled | B3 | B3 (B2 for 2 correct bars with labels and scale, B1 for a correct scale or labels) |
| 9 | (a) | $\frac{11}{25}$ | B1 | |
| | (b) | $\frac{17}{25}$ | B1 | |
| | (c) | 0 | B1 | |
| 10 | | No: he needs 540 g of flour | M1<br>M1<br>C1 | M1 for 45 ÷ 15 (= 3)<br>M1 for 180 × 3 (= 540)<br>C1 No with 540 |
| 11 | | Right-angled triangle with base 6 and height 4 squares | B2 | B2 (B1 for one side correctly enlarged) |



Mark scheme continues ►

| Q | | Answer | Mark | Notes |
|---|---|---|---|---|
| 12 | (a) | 22 | M1<br>A1 | M1 for $3 \times 4 + 2 \times 5$<br>A1 cao |
| | (b) | 9 | M1<br>A1 | M1 for $41 = 3m + 14$<br>A1 cao |
| | (c) | −11 | M1<br>A1 | M1 for $4 \times -2 - 3$<br>A1 cao |
| 13 | | 28 | M1<br>M1<br>M1<br>A1 | M1 for $60 \div 4$ (= 15)<br>M1 for $240 \div 15$ (= 16)<br>M1 for 16 + 12<br>A1 cao |
| 14 | | Straight line from (−2, −4) to (2, 8) | M1<br>M1<br>A1 | M1 for at least 2 correct points<br>M1 for at least 3 correct points plotted<br>A1 for a correct line from $x = -2$ to $x = 2$ |
| 15 | | 340 | M1<br>M1<br>M1<br>A1 | M1 for $0.15 \times 9600$ (= 1440)<br>M1 for 9600 − 1440 (= 8160)<br>M1 for $8160 \div 24$<br>A1 cao |
| 16 | | 65% of 80 = 52, and 53 > 52 | M1<br>C1 | M1 for $0.65 \times 80$ or $53 \div 80 \times 100$<br>C1 52 and 53 compared, or 66.25% and 65% compared |
| 17 | | $1\frac{5}{7}$ | M1<br>A1<br>A1 | M1 for $\frac{4}{7} \times \frac{3}{1}$<br>A1 for $\frac{12}{7}$<br>A1 for $1\frac{5}{7}$ |
| 18 | | 19.24 | M1<br>M1<br>A1 | M1 for a complete method, e.g. $52 \times 37 = 1924$<br>M1 for placing the decimal point correctly<br>A1 cao |
| 19 | (a) | 1 | B1 | |
| | (b) | $\frac{1}{16}$ | B1 | |
| | (c) | $3^5$ | M1<br>A1 | M1 for $3^{10}$ or 6 + 4 − 5<br>A1 cao |
| 20 | (a) | $2 \times 2 \times 3 \times 3 \times 5$ | M1<br>A1 | M1 for a factor tree or repeated division<br>A1 for $2^2 \times 3^2 \times 5$ oe |
| | (b) | 30 | M1<br>A1 | M1 for $150 = 2 \times 3 \times 5^2$ or listing factors<br>A1 cao |



Mark scheme continues ►

| Q | | Answer | Mark | Notes |
|---|---|---|---|---|
| 21 | (a) | 3 | M1<br>M1<br>A1 | M1 for 6 × 3.5 (= 21)<br>M1 for (21 − 6) ÷ 5<br>A1 cao |
| | (b) | The mean of the other 5 parcels is smaller (2.4 kg) | C1 | C1 |
| 22 | | Perpendicular at P with construction arcs | B2 | B2 (B1 for a perpendicular without arcs or correct arcs) |
| 23 | | 108 | M1<br>M1<br>M1<br>A1 | M1 for angle $BDA = x$<br>M1 for $3k + 3k + 4k = 180$ ($k = 18$)<br>M1 for $y = 72$<br>A1 cao |
| 24 | | 120 | M1<br>A1<br>M1<br>M1<br>A1 | M1 for $x + 2x + 3 + x - 1 = 34$<br>A1 for $x = 8$<br>M1 for $2 \times 8 + 3$ (= 19)<br>M1 for 285 ÷ 19 (= 15)<br>A1 cao |
| 25 | | 2.7 | M1<br>A1 | M1 for 54 ÷ 20<br>A1 cao |
| 26 | | 56 | M1<br>M1<br>A1 | M1 for rounding to 7, 4 and 0.5<br>M1 for 28 ÷ 0.5<br>A1 for 56 (accept 52 to 60 from other sensible rounding) |
| 27 | (a) | $2x^2 - 5x - 12$ | M1<br>A1 | M1 for 3 of 4 terms correct<br>A1 cao |
| | (b) | $(x + 5)(x - 5)$ | B1 | |

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

**Score ____ / 80**