

Primary 3 · Mathematics · Advanced Maths Practice

Mixed problems 4

Time **45 min** Marks **36** Questions **12**

Answers are printed in red after each question, with the working where it matters. Marks in brackets show how a marker would split them.

Section A

Questions 1 to 6 carry 2 marks each.

1 Which of the following fractions is **not** between $\frac{3}{8}$ and $\frac{5}{6}$? [2]

(1) $\frac{1}{2}$

(2) $\frac{2}{3}$

(3) $\frac{3}{4}$

(4) ✓ $\frac{7}{8}$

1. $3/8 = 0.375$ and $5/6 = 0.833$.
2. $1/2 = 0.5$, $2/3 = 0.667$ and $3/4 = 0.75$ all lie between them.
3. $7/8 = 0.875$, which is bigger than 0.833 .

2 What are the next two numbers in this pattern? [2]

4, 9, 8, 13, 12, 17, 16, ...

(1) 15, 20

(2) ✓ 21, 20

(3) 20, 25

(4) 21, 26

1. Two rules take turns: +5, then -1.
2. $4 + 5 = 9$, $9 - 1 = 8$, $8 + 5 = 13$, $13 - 1 = 12$, $12 + 5 = 17$, $17 - 1 = 16$.
3. Next: $16 + 5 = 21$, then $21 - 1 = 20$.

3 Three parcels are weighed in pairs. [2]

The book and the toy weigh 430 g together.

The toy and the mug weigh 510 g together.

The mug and the book weigh 480 g together.

How heavy is the toy on its own?

(1) 200 g

(2) ✓ 230 g

(3) 250 g

(4) 280 g

1. Add all three weighings: each parcel is counted twice, so twice the total is $430 + 510 + 480 = 1420$ g.

2. All three together weigh 710 g.

3. The toy is left out of the mug-and-book weighing, so $\text{toy} = 710 - 480 = 230$ g.

4 P, Q and R stand for three different digits. A three-digit number reads P, then Q, then P again. Multiplying it by 4 gives the four-digit number 1 R 8 8. What is $P + Q + R$? [2]

(1) ✓ 9

(2) 12

(3) 15

(4) 18

1. The product ends in 8, so $P \times 4$ ends in 8. P is 2 or 7.

2. $PQP \times 4$ starts with 1, so PQP is between 250 and 499. That rules out $P = 7$, so $P = 2$.

3. $2Q2 \times 4 = 1R88$. Trying the digits: $272 \times 4 = 1088$.

4. So $Q = 7$ and $R = 0$, and 2, 7 and 0 are all different.

5. $P + Q + R = 2 + 7 + 0 = 9$.

- 5 A pencil tin holds pencils in 5 different colours. Ben takes 2 pencils from the tin. How many different pairs of colours can he end up with? [2]

(1) 10

(2) ✓ 15

(3) 20

(4) 25

1. The two pencils may be the same colour or different colours.
2. Same colour: 5 choices.
3. Different colours: the number of ways to choose 2 colours out of 5 is 10.
4. $5 + 10 = 15$.

- 6 A round running track is 600 m long. A cone is placed every 15 m around the track, and a marker is placed every 5 m between two neighbouring cones. How many markers are there? [2]

(1) ✓ 80

(2) 120

(3) 160

(4) 200

1. Cones: $600 \div 15 = 40$ cones.
2. Between two cones there are two markers, at 5 m and at 10 m. The 15 m point is the next cone.
3. $40 \text{ gaps} \times 2 \text{ markers} = 80 \text{ markers}$.

ANSWERS AT A GLANCE

1 4	2 2	3 2	4 1	5 2	6 1
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Section B

Questions 7 to 12 carry 4 marks each. Show your working.

- 7 Lina saved money for 12 days. She saved \$8 on the first day, \$11 on the second day and \$14 on the third day. The pattern carries on. How much did she save altogether? [4]

1. She saves \$3 more each day: 8, 11, 14, ..., up to 12 days.
2. The last day is $8 + 11 \times 3 = \$41$.
3. Total = $12 \times (8 + 41) \div 2 = 12 \times 24.5 = \294 .
4. $12 \times 49 \div 2 = 294$.

ANSWER \$294

- 8** Jugs A, B and C together hold exactly enough water to fill one tank. [4]
 Pouring in only jug A leaves the tank 180 ml short.
 Pouring in only jug B leaves it 240 ml short.
 Pouring in only jug C leaves it 300 ml short.
 How much water does the tank hold?

1. $A + B + C$ equals the tank, call it T .
2. $B + C = T - 180$, $A + C = T - 240$, $A + B = T - 300$.
3. Add them: $2(A + B + C) = 3T - 720$, so $2T = 3T - 720$.
4. $T = 720$ ml.

ANSWER 720 ml

Check: $A = 720 - 240 - 300 = 180$, and the tank is 180 ml short without B and C. $180 + 240 + 300 = 720$.

- 9** $A3$ and $6B$ stand for two-digit numbers. [4]

$$\frac{A3}{6B} = \frac{1}{2}$$

What is $A \times B$?

1. $A3 = 10 \times A + 3$ and $6B = 60 + B$.
2. $2 \times (10A + 3) = 60 + B$, so $20A + 6 = 60 + B$.
3. $B = 20A - 54$.
4. B is a single digit from 0 to 9, so $A = 3$ gives $B = 6$.
5. Check: 33 is exactly half of 66. So $A \times B = 3 \times 6 = 18$.

ANSWER 18

- 10** Farah got home from a trip at 3 p.m. on Friday. She had left home 100 hours earlier. [4]
 On what day and at what time did she leave?

1. $100 \div 24 = 4$ days with a remainder of 4 hours, since $4 \times 24 = 96$.
2. 4 days before Friday is Monday.
3. 4 hours before 3 p.m. is 11 a.m.
4. She left at 11 a.m. on Monday.

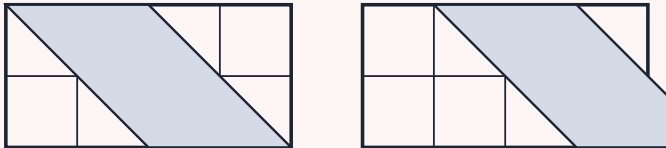
ANSWER 11 a.m. on Monday

- 11 A rectangle has a perimeter of 48 cm. Its length and breadth are different whole numbers. What is the greatest possible area of the rectangle? [4]

1. Length + breadth = $48 \div 2 = 24$ cm.
2. The area is largest when the two sides are as close as possible, but they must be different.
3. 11 and 13 are the closest different whole numbers that add to 24.
4. Area = $13 \times 11 = 143 \text{ cm}^2$.

ANSWER **143 cm²**

- 12 Figure A shows a rectangle made of 8 identical squares, with a shaded band across it. In Figure B the band has been slid one square to the right, so a piece of it now hangs outside the rectangle and a piece of the rectangle is uncovered. What fraction of Figure B is shaded? [4]



1. The band in Figure A covers half of the rectangle: 4 of the 8 squares.
2. Sliding it one square to the right pushes half a square out past the right edge and uncovers half a square at the left edge.
3. The shaded part that remains inside is $4 - 0.5 = 3.5$ squares.
4. 3.5 out of 8 squares is $7/16$.

ANSWER **7/16**

The piece hanging outside the rectangle is not part of Figure B, so it is not counted.

Marking notes

- Section A: 2 marks for the correct option.
- Section B: 1 mark for a correct first step, 2 marks for the method carried through, 1 mark for the answer with its unit.
- A correct answer in Section B with no working scores 1 mark only.

END OF PAPER