Maths Entry Level 3 Complete Study Guide

Everything you need to know — explained step by step
10 Topics | Worked Examples | Practice Questions

rewired for parents

About the EL3 Maths Exam

Total marks: 60 | **Pass mark:** 36 (60%)

Section A: Non-calculator — 15 marks, 30 minutes, 9 questions

Section B: Calculator allowed — 45 marks, 75 minutes, 16 questions

25 questions total — a mix of multiple choice and written answers

Contents

1. Addition & Subtraction
2. Multiplication & Division
3. Money Calculations
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5. Fractions
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7. Measurement & Units
8. Rounding & Estimating
9. Charts, Tables & Data
10. Shape, Perimeter & Area

1. Addition & Subtraction

Column Addition

Rule: Line up the digits by place value. Add each column from right to left. If a column totals 10 or more, carry the tens digit into the next column.

Worked Example: 367 + 485

```
  367
+ 485
-----
  852

Step 1: 7 + 5 = 12. Write 2, carry 1.
Step 2: 6 + 8 + 1 = 15. Write 5, carry 1.
Step 3: 3 + 4 + 1 = 8.
Answer: 852
```

Worked Example: 1,246 + 578

```
  1246
+  578
------
  1824

Step 1: 6 + 8 = 14. Write 4, carry 1.
Step 2: 4 + 7 + 1 = 12. Write 2, carry 1.
Step 3: 2 + 5 + 1 = 8.
Step 4: 1 + 0 = 1.
Answer: 1,824
```

Column Subtraction (Borrowing)

Rule: Line up the digits. Subtract each column right to left. If the top digit is smaller, borrow 1 from the next column (adding 10 to the current column).

Worked Example: 503 - 287

```
  503
- 287
-----
  216

Step 1: 3 - 7? Borrow. Tens = 0, so borrow from hundreds.
5 becomes 4, 0 becomes 10, then 10 becomes 9, 3 becomes 13.
Step 2: 13 - 7 = 6
Step 3: 9 - 8 = 1
Step 4: 4 - 2 = 2
Answer: 216
```

Tip: Check subtraction by adding your answer to the smaller number. 216 + 287 = 503. Correct!

Common Mistake: When borrowing from zero, you need to go to the next column along. This is where most mistakes happen.

Adding Three or More Numbers

Worked Example: 145 + 267 + 88

```
  145
  267
+ 88
-----
  500
```

Ones: 5 + 7 + 8 = 20. Write 0, carry 2.

Tens: 4 + 6 + 8 + 2 = 20. Write 0, carry 2.

Hundreds: 1 + 2 + 0 + 2 = 5.

Answer: 500

Practice Questions

1. 456 + 378
2. 1,000 - 463
3. 82 + 145 + 73
4. 604 - 259
5. You have £850 and pay £367. Left?

Answers: 1) 834 2) 537 3) 300 4) 345 5) £483

2. Multiplication & Division

Times Tables You Must Know

Essential: You need times tables up to 12 x 12. Tricky ones: 7x8=56, 6x7=42, 8x9=72, 7x9=63, 6x8=48, 12x7=84, 12x8=96.

Multiplying Larger Numbers

Worked Example: 34 x 6

```
Method: Split into parts
34 x 6 = (30 x 6) + (4 x 6)
= 180 + 24
= 204
```

Worked Example: 125 x 8

```
125
x 8
-----
1,000
5 x 8 = 40. Write 0, carry 4.
2 x 8 = 16 + 4 = 20. Write 0, carry 2.
1 x 8 = 8 + 2 = 10.
Answer: 1,000
```

Division

Division is splitting into equal groups. 72 / 9 means 'how many 9s fit into 72?' Answer: 8, because 9 x 8 = 72.

Worked Example: 156 / 12

```
Think: 12 x ? = 156
12 x 10 = 120
12 x 13 = 156
Answer: 13
```

Tip: If stuck on division, use times tables backwards. For 96 / 8, think '8 x what = 96?' Answer: 12.

Common Mistake: 'Each', 'per', 'shared equally' = division. 'Total', 'altogether' = multiplication.

Remainders

Worked Example: 50 / 8

```
8 x 6 = 48 (closest without going over)
50 - 48 = 2 left over
Answer: 6 remainder 2
```

Practice Questions

1. 7 x 9
2. 144 / 12
3. 45 x 6
4. Boxes hold 8 items. How many for 200?

5. Tickets £9 each, 7 friends. Total?

Answers: 1) 63 2) 12 3) 270 4) 25 boxes 5) £63

3. Money Calculations

Adding and Subtracting Money

Rule: Line up the decimal points. Both numbers need two decimal places. Work with pence — it is just whole-number addition with a decimal point.

Worked Example: £4.75 + £3.80

```
4.75
+ 3.80
------
8.55
Answer: £8.55
```

Worked Example: Change from £20 after spending £13.65

```
Count up method:
£13.65 -> £14.00 = 35p
£14.00 -> £20.00 = £6.00
Total change: £6.35
```

Multiplying Money

Worked Example: 4 coffees at £2.85 each

```
£2.85 x 4
= 285p x 4
= 1,140p
= £11.40
```

Splitting a Bill

Worked Example: £63.00 split 3 ways

```
£63.00 / 3 = £21.00
```

Tip: For change questions, counting up is often quicker than subtraction. Count from the price up to the amount paid.

Common Mistake: Always write the £ sign and use exactly two decimal places. £7.50, not £7.5.

Practice Questions

1. £6.45 + £3.78
2. Change from £50 after £32.75
3. 6 meals at £8.50 each
4. £96.00 split 4 ways
5. Items: £4.99, £2.50, £1.75. Total?

Answers: 1) £10.23 2) £17.25 3) £51.00 4) £24.00 5) £9.24

4. Time

12-hour and 24-hour Clock

Converting: For PM times, add 12 to the hour. 3:45pm = 15:45. For 24-hour to 12-hour, subtract 12 from hours above 12. 17:20 = 5:20pm.

12-hour	24-hour	12-hour	24-hour
12:00am	00:00	12:00pm	12:00
1:00am	01:00	1:00pm	13:00
6:00am	06:00	6:00pm	18:00
9:30am	09:30	9:30pm	21:30
11:45am	11:45	11:45pm	23:45

Calculating Time Differences

Counting-up method: Count from start to end in easy steps. This avoids mistakes with borrowing minutes.

Worked Example: 09:45 to 14:20

```
09:45 -> 10:00 = 15 minutes
10:00 -> 14:00 = 4 hours
14:00 -> 14:20 = 20 minutes
Total: 4 hours 35 minutes
```

Worked Example: Film starts 7:35pm, lasts 1hr 50min

```
7:35pm + 1 hour = 8:35pm
8:35pm + 25min = 9:00pm
9:00pm + 25min = 9:25pm
Answer: 9:25pm
```

Tip: Add hours first, then minutes. If minutes go over 60, subtract 60 and add 1 hour.

Common Mistake: 60 minutes = 1 hour, not 100! So 1.5 hours = 1 hour 30 minutes, not 1 hour 50 minutes.

Key Time Facts

60 sec = 1 min | **60** min = 1 hr | **24** hrs = 1 day | **7** days = 1 week | **365** days = 1 year | **31-day months:** Jan, Mar, May, Jul, Aug, Oct, Dec | **30-day months:** Apr, Jun, Sep, Nov | **Feb:** 28 (29 leap year)

Practice Questions

1. Convert 4:15pm to 24-hour
2. Convert 21:40 to 12-hour
3. How long from 08:50 to 13:25?
4. Train departs 14:35, journey 2hrs 45min. Arrival?
5. Work 09:00-17:30 Mon-Fri. Weekly hours?

Answers: 1) 16:15 2) 9:40pm 3) 4hrs 35min 4) 17:20 5) 42.5 hours

5. Fractions

What is a Fraction?

A fraction shows part of a whole. The **denominator** (bottom) = how many equal parts. The **numerator** (top) = how many parts you have. 3/4 means 3 out of 4 equal parts.

Finding a Fraction of an Amount

Method: Divide by the denominator, then multiply by the numerator. To find 3/4 of 60: divide 60 by 4 = 15, then multiply by 3 = 45.

Worked Example: Find 2/3 of 45

```
Step 1: Divide by 3: 45 / 3 = 15
Step 2: Multiply by 2: 15 x 2 = 30
Answer: 30
```

Worked Example: Find 3/8 of 56

```
Step 1: 56 / 8 = 7
Step 2: 7 x 3 = 21
Answer: 21
```

Comparing Fractions

Same denominator: Bigger numerator = bigger fraction (3/5 > 2/5). **Same numerator:** Bigger denominator = smaller fraction (1/3 > 1/4 > 1/8). The more pieces you cut, the smaller each piece.

Simple Fraction Addition

Worked Example: 1/4 + 1/2

```
Make denominators the same:
1/2 = 2/4
Now add: 1/4 + 2/4 = 3/4
```

Tip: At EL3, the divide step should always give a whole number. If it does not, double-check your working.

Practice Questions

1. Find 1/4 of 120
2. Find 3/5 of 40
3. Which is bigger: 2/3 or 3/4?
4. Pizza with 8 slices, eat 3. Fraction left?
5. 1/2 + 1/4 = ?

Answers: 1) 30 2) 24 3) 3/4 4) 5/8 5) 3/4

6. Decimals

Understanding Place Value

3.75 = 3 ones + 7 tenths + 5 hundredths. The first digit after the decimal is **tenths**. The second digit is **hundredths**. So 0.3 > 0.25 (3 tenths > 2 tenths).

Adding and Subtracting Decimals

Rule: Line up decimal points. Add trailing zeros so both have the same number of decimal places. Then add/subtract as normal.

Worked Example: 3.6 + 1.85

```
3.60 (added a zero)
+ 1.85
------
5.45
```

Worked Example: 10 - 4.37

```
Count up: 4.37 -> 5.00 = 0.63
5.00 -> 10.00 = 5.00
Total: 5.63
```

Multiplying and Dividing Decimals

Worked Example: 0.6 x 4

```
6 x 4 = 24. One decimal place -> answer 2.4
```

Fractions and Decimals

Fraction	Decimal	Fraction	Decimal
1/2	0.5	1/5	0.2
1/4	0.25	2/5	0.4
3/4	0.75	1/10	0.1
1/3	0.33...	3/10	0.3

Common Mistake: When ordering decimals, compare digit by digit. 0.8 > 0.75 because 8 tenths > 7 tenths. Do not be tricked by the number of digits.

Practice Questions

1. 2.45 + 3.7
2. 8 - 2.63
3. 0.5 x 8
4. Order smallest first: 0.6, 0.55, 0.605
5. Convert 3/4 to decimal

Answers: 1) 6.15 2) 5.37 3) 4.0 4) 0.55, 0.6, 0.605 5) 0.75

7. Measurement & Units

Metric Units You Must Know

Type	Small	Conversion	Large
Length	mm	10 mm = 1 cm	cm
Length	cm	100 cm = 1 m	m
Length	m	1,000 m = 1 km	km
Weight	g	1,000 g = 1 kg	kg
Capacity	ml	1,000 ml = 1 L	litres

Converting Units

Big to small: MULTIPLY. Small to big: DIVIDE. Example: 2.5 kg to grams = 2.5 x 1,000 = 2,500g.

Worked Example: Convert 350 cm to metres

```
cm to m = small to big = DIVIDE
350 / 100 = 3.5m
```

Worked Example: Which is heavier — 1,500g or 1.8kg?

```
Convert to same unit:
1.8 kg = 1,800g
1,500g vs 1,800g
1.8 kg is heavier
```

Choosing the Right Unit

mm = tiny (coin thickness) | **cm** = small (pencil) | **m** = rooms, buildings | **km** = distances between places | **g** = light (bread slice) | **kg** = heavier (bag of sugar) | **ml** = small liquid (cup of tea) | **litres** = larger liquid (bottle of milk)

Practice Questions

1. Convert 3.2 kg to grams
2. Convert 750 ml to litres
3. Which is longer: 2.5m or 240cm?
4. Recipe needs 250g. You have 1kg. Batches?
5. Unit for London to Manchester?

Answers: 1) 3,200g 2) 0.75L 3) 2.5m (250cm > 240cm) 4) 4 batches 5) km

8. Rounding & Estimating

How to Round

Step 1: Find the digit you are rounding to. **Step 2:** Look at the digit to its right. **Step 3:** If 5 or more = round UP. If 4 or less = round DOWN (keep same).

Worked Example: Round 367 to the nearest 10

```
Tens digit: 6. Look at ones: 7.
7 >= 5 -> round UP.
367 -> 370
```

Worked Example: Round 2,450 to the nearest 1,000

```
Thousands digit: 2. Look at hundreds: 4.
4 < 5 -> round DOWN.
2,450 -> 2,000
```

Worked Example: Round 3.67 to 1 decimal place

```
Tenths digit: 6. Look at hundredths: 7.
7 >= 5 -> round UP.
3.67 -> 3.7
```

Estimating Calculations

To estimate: Round each number to something easy, then calculate with the rounded numbers.

Worked Example: Estimate 48 x 21

```
Round: 48 -> 50 and 21 -> 20
Estimate: 50 x 20 = 1,000
```

Worked Example: Cost of 4 items at £3.89 each

```
Round: £3.89 -> £4
Estimate: 4 x £4 = £16
```

Tip: 'Approximately' or 'estimate' in the exam means round first, then calculate. They want sensible rounding, not an exact answer.

Practice Questions

1. Round 845 to nearest 100
2. Round 4.83 to 1 d.p.
3. Estimate 197 + 412
4. Estimate 3 shirts at £19.95
5. Round 6,750 to nearest 1,000

Answers: 1) 800 2) 4.8 3) ~600 4) ~£60 5) 7,000

9. Charts, Tables & Data

Reading Bar Charts

Bar charts use bars to show amounts. Height = value. Always check the scale — each gridline might represent 2, 5, 10 etc.

Worked Example: Sales — Mon: 20, Tue: 35, Wed: 15, Thu: 25

```
Total = 20 + 35 + 15 + 25 = 95
Busiest = Tuesday (35)
Quietest = Wednesday (15)
Range = 35 - 15 = 20
```

Pictograms

Pictograms use pictures for data. Each picture = a set number (check the key). Half a picture = half that number.

Worked Example: Key says each star = 6. Row shows 3.5 stars.

```
3 full stars = 3 x 6 = 18
Half star = 6 / 2 = 3
Total = 21 people
```

Tally Charts

A tally groups lines in fives (four lines + diagonal). IIII = 5. Count in fives then add extras. IIII IIII III = 5 + 5 + 3 = 13.

Finding the Range

Range = Highest Value - Lowest Value

Common Mistake: Check where the TOP of the bar meets the scale. Watch for scales that do not start at zero.

Practice Questions

1. Pictogram: 4.5 symbols, each = 8. Total?
2. Bar chart: Red 12, Blue 18, Green 6. Range?
3. Tally: IIII IIII IIII II. Number?
4. Table: S £3, M £5, L £7. 2 Large + 1 Small?
5. Blue 18 out of total 36. Fraction?

Answers: 1) 36 2) 12 3) 17 4) £17 5) 1/2

10. Shape, Perimeter & Area

2D Shape Names

Triangle 3 sides | **Rectangle** 4 sides, 4 right angles | **Square** 4 equal sides | **Pentagon** 5 | **Hexagon** 6 | **Octagon** 8

Perimeter

Perimeter = total distance around the outside. Add all sides.

Rectangle: P = 2 x (length + width)

Square: P = 4 x side

Worked Example: Rectangle 12m x 5m

```
P = 2 x (12 + 5) = 2 x 17 = 34m
```

Area

Area = space inside a flat shape. Measured in square units (cm², m²).

Rectangle: A = length x width

Triangle: A = (base x height) / 2

Worked Example: Rectangle 8m x 6m

```
A = 8 x 6 = 48m²
```

Worked Example: Triangle, base 10cm, height 6cm

```
A = (10 x 6) / 2 = 60 / 2 = 30cm²
```

Compound Shapes (L-shapes)

Method: Split into rectangles. Find each area. Add together.

Worked Example: L-shape = 6x4 + 3x2

```
Area 1 = 6 x 4 = 24
Area 2 = 3 x 2 = 6
Total = 30m²
```

3D Shapes

Cube 6 square faces | **Cuboid** 6 rectangular faces | **Cylinder** 2 circles + 1 curved | **Sphere** 1 curved | **Cone** 1 circle + 1 curved + 1 point

Common Mistake: Perimeter = distance AROUND (m, cm). Area = space INSIDE (m², cm²). Fence = perimeter. Carpet = area.

Practice Questions

1. Rectangle perimeter: 15m x 8m
2. Square area: sides 9cm
3. Triangle area: base 12cm, height 5cm
4. Garden 20x12m, shed 4x3m. Remaining area?
5. Sides of an octagon?

Answers: 1) 46m 2) 81cm² 3) 30cm² 4) 228m² 5) 8