

Aldenham School | 11+ Maths

Worked solutions to the supplied sample paper (uploaded as 2025).

Prepared by Prep Expert. Independent worked answers; not an official school mark scheme.

1. Rounding

- a) **150**. The units digit in 146 is 6, so round up to the next ten.
b) **6000**. The hundreds digit in 6283 is 2, so round down to 6000.

2. Multiplication and division

- a) **1968**. $246 \times 8 = (200 \times 8) + (40 \times 8) + (6 \times 8)$
 $= 1600 + 320 + 48 = \mathbf{1968}$.
b) **648**. $2592 \div 4 = (2400 \div 4) + (192 \div 4) = 600 + 48 = \mathbf{648}$.

3. Missing numbers

- a) **8**, since $8 \times 8 = 64$.
b) **8**, since $240 \div 30 = 8$.
c) **50**, since $20 \div 0.4 = 200 \div 4 = 50$.
d) **-2**, since $28 - (-2) = 28 + 2 = 30$.

4. Venn diagram

Multiples of 3 only: 24.

Both circles: 3, 12.

Factors of 12 only: 2, 4.

Outside both circles: 5, 10.

The overlap contains numbers that satisfy both descriptions.

5. Change from £10

Two coffees cost $2 \times £1.60 = £3.20$.

Total cost = $£3.20 + £1.70 + £1.90 = £6.80$.

Change = $£10.00 - £6.80 = \mathbf{£3.20}$.

6. Scaling the recipe

$24 \div 8 = 3$, so multiply every ingredient by 3.

- a) **12 tablespoons** of golden syrup: $4 \times 3 = 12$.
b) **200 g more sugar**. Required sugar = $400 \times 3 = 1200$ g.
 $1 \text{ kg} = 1000 \text{ g}$, so buy $1200 - 1000 = \mathbf{200 \text{ g}}$.

Worked solutions | Questions 7-11

Use the order of operations and check coordinates carefully.

7. Percentage increase

10% of £480 = £48, so 30% = $3 \times £48 = £144$.

2019 total = £480 + £144 = **£624**.

8. Arthur's age

Subtract the two sisters' extra 4 years: $77 - 4 - 4 = 69$.

Divide equally: $69 \div 3 = \mathbf{23 \text{ years}}$.

Check: Arthur is 23 and each sister is 27; $23 + 27 + 27 = 77$.

9. Largest calculation

Do multiplication before addition:

$$3 + 0 + 2 + 8 = 13$$

$$3 \times 0 + 2 + 8 = 10$$

$$3 + 0 \times 2 + 8 = 11$$

$$\mathbf{3 + 0 + 2 \times 8 = 19}$$
 - circle this calculation.

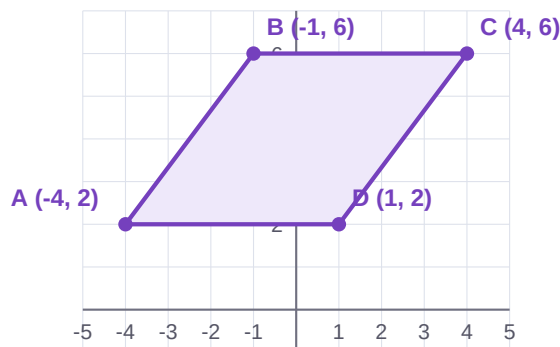
$$3 \times 0 + 2 \times 8 = 16$$

10. Rhombus coordinates

a) Plot A = (-4, 2), B = (-1, 6) and C = (4, 6), as shown below.

b) **Missing vertex: (1, 2)**. From B to C, move 5 units right.

Make the same move from A: $(-4 + 5, 2) = \mathbf{(1, 2)}$.



11. Factors of 60

120 is not a factor of 60.

$60 \div 15 = 4$ and $60 \div 60 = 1$, but $60 \div 120$ is not a whole number.

Worked solutions | Questions 12-17

Show equivalent fractions and intermediate calculations.

12. Area of the L-shape

Use a large rectangle minus the missing rectangle.

Large rectangle: $10 \times 7 = 70 \text{ cm}^2$.

Missing rectangle: width 6 cm; height $7 - 2 = 5 \text{ cm}$.

Missing area = $6 \times 5 = 30 \text{ cm}^2$.

Area of shape = $70 - 30 = 40 \text{ cm}^2$.

13. Smallest values

a) 0.102. Write the values to three decimal places:

0.102, 0.120, 0.112, 0.201. The smallest is **0.102**.

b) 18/25. Convert all values to percentages:

$0.8 = 80\%$; $3/4 = 75\%$; $73\% = 73\%$; $18/25 = 72\%$.

The smallest is 72%, so circle **18/25**.

14. Subtracting fractions

Use a common denominator of 30:

$2/3 - 3/10 = 20/30 - 9/30 = 11/30$.

This fraction is already in its simplest form.

15. 23% of 1200

$20\% = 240$ and $3\% = 36$.

$23\% \text{ of } 1200 = 240 + 36 = 276$.

16. Ascending order

Work out each complete expression:

$(3/5) \text{ of } 30 = 30 \div 5 \times 3 = 18$.

$(7/10) \text{ of } 20 = 20 \div 10 \times 7 = 14$.

$(2/3) \text{ of } 24 = 24 \div 3 \times 2 = 16$.

Ascending order: $(7/10)$ of 20, $(2/3)$ of 24, $(3/5)$ of 30.

Their values are 14, 16, 18. Compare the calculated amounts, not just the fractions.

17. Substitution and comparison

Given $a = 5$, $b = 10$ and $c = 2$:

a) = because $2a - c = 2 \times 5 - 2 = 8$ and $c^3 = 2 \times 2 \times 2 = 8$.

b) < because $3a^2 = 3 \times 25 = 75$ and $8b = 8 \times 10 = 80$.

Remember: $3a^2$ means $3 \times a \times a$, not $(3a)^2$.

Worked solutions | Questions 18-24

Geometry, averages and multi-step problems.

18. Angles in an isosceles triangle

B, C and D lie on a straight line, so angle ACB = $180^\circ - 62^\circ = 118^\circ$.

The marks show $AC = BC$, so the angles at A and B are equal.

$$x = (180^\circ - 118^\circ) \div 2 = \mathbf{31^\circ}.$$

19. Solving equations

a) $x = 20$. Multiply both sides of $x/2 = 10$ by 2.

b) $b = 33$. From $2b - 25 = 41$, add 25 to both sides:

$$2b = 66. \text{ Divide by 2: } b = \mathbf{33}.$$

20. Mean number of tractors

Read the graph: May 50, June 30, July 30, August 20, September 70.

$$\text{Total} = 50 + 30 + 30 + 20 + 70 = 200.$$

a) **40 tractors**. Mean = $200 \div 5 = 40$.

b) **10 tractors**. With October included there are 6 months.

$$\text{New total} = 35 \times 6 = 210. \text{ October} = 210 - 200 = \mathbf{10}.$$

21. Fraction below the median

Put the numbers in order: 2, 4, 5, 7, 10.

The median is 5. Two of the five numbers (2 and 4) are below it.

$$\text{Required fraction} = \mathbf{2/5}.$$

22. Cost of a coffee

Work in pence. Two teas + one coffee = 250p.

Double the second purchase: two teas + six coffees = 700p.

Subtract the first purchase: five coffees = $700 - 250 = 450$ p.

$$\text{One coffee} = 450 \div 5 = \mathbf{90p}.$$

23. Length of the bridge

$$\text{Fraction over the banks} = 1/4 + 1/3 = 3/12 + 4/12 = 7/12.$$

$$\text{Fraction over the river} = 1 - 7/12 = 5/12.$$

5/12 of the bridge is 84 m, so 1/12 is $84 \div 5 = 16.8$ m.

$$\text{Whole bridge} = 16.8 \times 12 = \mathbf{201.6 \text{ m}}.$$

24. An odd number of factors

Factors normally come in pairs. For a square number, its square root pairs with itself, giving an odd number of factors.

The squares between 50 and 150 are:

$$8^2 = 64, 9^2 = 81, 10^2 = 100, 11^2 = 121, 12^2 = 144.$$

Answer: 64, 81, 100, 121, 144.