8 Arithmetic: Division of Decimals

8.1 Mental Division of Whole Numbers

The process of division is multiplication in reverse. So, since $4 \times 3 = 12$, then $12 \div 4 = 3$ and $12 \div 3 = 4$. You also need to remember the order in which operations must be carried out, which can be summarised by BODMAS:

Brackets first

O

Divide

Multiply

Add

Subtract

Example

Calculate (a) $16 \times 2 + 3$, (b) $16 \times (2 + 3)$.

Solution

(a) $16 \times 2 + 3 = 32 + 3$ (**M** before **A**)

$= 35$

(b) $16 \times (2 + 3) = 16 \times 5$ (**B** before **M**)

$= 80$

Exercises

1. Find

(a)	$16 \div 4$	(b)	$12 \div 6$	(c)	$15 \div 5$
(d)	$20 \div 4$	(e)	$18 \div 9$	(f)	$40 \div 8$
(g)	$36 \div 9$	(h)	$15 \div 3$	(i)	$64 \div 8$
(j)	$42 \div 7$	(k)	$24 \div 6$	(l)	$32 \div 8$
(m)	$49 \div 7$	(n)	$56 \div 8$	(o)	$45 \div 5$

2. Is each of these statements *true* or *false*?

(a)	$10 \div 2 = 2 \div 10$	(b)	$12 + 8 \div 2 = 10$
(c)	$3 + 12 \div 4 = 6$	(d)	$6 \div 2 + 3 = 6$

3. Find:

(a)	$3 + 4 \times 8$	(b)	$8 + 3 \times 6$	(c)	$8 \times 6 - 4$
(d)	$12 \div 2 + 5$	(e)	$5 - 12 \div 3$	(f)	$14 \div 2 + 8$
(g)	$3 \times 2 + 8 \div 4$	(h)	$3 \times 6 - 15 \div 3$	(i)	$42 \div 7 + 3$
(j)	$16 \div 4 + 24 \div 6$	(k)	$8 \times 2 + 5 \times 3$	(l)	$8 \times 6 - 45 \div 5$

4. A pupil works out $200 \div 4$ by this method:

$$200 \div 2 = 100$$
$$100 \div 2 = 50$$

Use similar methods to find:

(a)	$500 \div 4$	(b)	$52 \div 4$	(c)	$68 \div 4$
(d)	$128 \div 4$	(e)	$224 \div 4$	(f)	$104 \div 8$
(g)	$80 \div 16$	(h)	$112 \div 16$	(i)	$128 \div 8$

8.2 Division Methods for Whole Numbers and Decimals

Care must be taken when handling divisions, particularly when they involve decimals.

Example

Find

(a) $1300 \div 100$

(b) $1.75 \div 5$

(c) $6.31 \div 4$

Solution

(a) $1300 \div 100 = \dfrac{1300}{100}$

$= 13$

(b) $1.75 \div 5 = 0.35$ since $5\overline{)1.75}$ 0.35

(c) $631 \div 4$ gives $4\overline{)631}$ $\begin{matrix}157 \\ {\scriptstyle 2\ 3}\end{matrix}$ r 3, i.e. 157 with remainder 3

Alternatively, to get the answer in decimal form, write

$$4\overline{)631.00} \quad \begin{matrix}157.75 \\ {\scriptstyle 2\ 3\ 3\ 2}\end{matrix} \qquad \text{i.e. } 157.75$$

Exercises

1. Find:

(a)	$12 \div 10$	(b)	$4200 \div 10$
(c)	$600\,000 \div 10$	(d)	$3714 \div 10$
(e)	$5728 \div 10$	(f)	$6000 \div 100$
(g)	$7000 \div 1000$	(h)	$75\,000 \div 100$
(i)	$750 \div 100$	(j)	$3714 \div 100$
(k)	$8412 \div 100$	(l)	$642\,130 \div 10\,000$

2. Carry out the following divisions.

(a)	$69 \div 3$	(b)	$4545 \div 9$	(c)	$6612 \div 3$
(d)	$2947 \div 7$	(e)	$7404 \div 6$	(f)	$37\,050 \div 5$
(g)	$2208 \div 12$	(h)	$13\,488 \div 24$	(i)	$1792 \div 32$
(j)	$10\,530 \div 45$	(k)	$4284 \div 18$	(l)	$10\,496 \div 41$

3. Carry out the following divisions.

(a)	$2.54 \div 2$	(b)	$21.63 \div 3$	(c)	$10.24 \div 4$
(d)	$87.5 \div 5$	(e)	$918.4 \div 7$	(f)	$49.24 \div 4$
(g)	$388.5 \div 15$	(h)	$123.84 \div 12$	(i)	$714.84 \div 6$

4. Carry out the following divisions, giving your answers as decimals.

(a)	$21 \div 4$	(b)	$81 \div 2$	(c)	$162 \div 4$
(d)	$263 \div 4$	(e)	$84 \div 8$	(f)	$241 \div 8$

8.3 Division Problems

As with multiplication, division is often needed in practical problems.

Example

45 sweets are divided equally between 9 children. How many do they each get?

Solution

Each child gets $45 \div 9 = 5$ sweets.

Exercises

1. A mini chocolate bar costs 8p. How many bars can be bought with 72p?

2. A multistorey car park has 4 levels, each taking the same number of cars. When full it holds 124 cars. How many cars can park at each level?

3. A train can carry 384 passengers. If has 8 carriages, each with the same seating capacity. How many people can each carriage hold?

4. Rafiq borrows £50 from his Dad. He pays it back in 10 equal weekly instalments. How much does he pay back each week?

5. £375.69 is raised at a jumble sale. This is divided equally between 3 charities. How much does each of the charities get?

6. Grace and her 3 brothers are given £37 to share equally between them. How much do they get each?

7. Charlotte has 24 sweets. She shares them out equally between herself and her 3 friends. How many sweets do they get each?

8. Three children are paid £15 for working in a garden. They share the money equally between them. How much do they get each?

9. Karen buys 6 tickets, each costing the same, for the theatre. She pays a total of £54 for the tickets. How much does each ticket cost?

10. A rope is 22.48 m long. It is cut into 4 parts of equal length. How long is each part?

11. A baker mixes 1944 grams of dough. It is used to make 12 small loaves of equal weight. How much dough is used in each loaf?

12. Rachel, Ben, Emma and Hannah are given £5.50 to share equally between them. Describe the problem they have.

13. 40 children want to go on a school trip to Wimbledon. They will be taken in minibuses that each hold 13 passengers. How many minibuses will be needed for the trip?

14. How many chocolate bars costing 23p each can I buy with £2?

15. The 'Oblivion' ride at Alton Towers takes 16 people each time it goes around. How many times must it go around if 70 people want to have a go?

16. A teacher has 240 grams of clay. She cuts off lumps of mass 35 grams each.
    (a) How many lumps can she make?
    (b) How much clay is left over?

17. John sees some cassette tapes that cost 85p each. He has £5.
    (a) How many tapes can he buy?
    (b) If he buys as many tapes as he can, how much change will he have?

18. A text book costs £7.50. A teacher has £149 to spend on books. How many copies of this text book can she buy?