

Name \_\_\_\_\_

Date \_\_\_\_\_

## 7.5 Making fraction calculations easier — worksheet

Use the structure of a calculation — cancelling, reordering and dividing before multiplying — to work with fractions efficiently. · 39 questions · Show your working.

### Remember

- Look at a calculation before you start it — the order is your choice.
- **Cancel first** when multiplying, so the numbers stay small and the answer is already simplified.
- For a fraction of a quantity, **divide first, then multiply**:  $\frac{3}{4}$  of 48 is  $48 \div 4 \times 3$ , not  $48 \times 3 \div 4$ .
- In an addition, **reorder** to pair fractions that make a whole:  $\frac{1}{4} + \frac{1}{2} + \frac{3}{4}$  becomes  $1 + \frac{1}{2}$ .
- Spot **reciprocals**:  $\frac{5}{8} \times \frac{8}{5} = 1$ , no working needed.
- Addition and multiplication may be reordered freely; subtraction and division may not.
- Estimating first tells you roughly what to expect, so a slip stands out.
- The efficient route is not a different method — it is the same method, done in a kinder order.

### A · Fluency — Choose the easy order.

- 1 Work out  $\frac{1}{4} + \frac{1}{2} + \frac{3}{4}$  \_\_\_\_\_
- 2 Work out  $\frac{2}{5} + \frac{1}{5} + \frac{2}{5}$  \_\_\_\_\_
- 3 Work out  $\frac{1}{3} + \frac{1}{6} + \frac{1}{2}$  \_\_\_\_\_
- 4 Work out  $\frac{3}{8} + \frac{1}{8} + \frac{1}{2}$  \_\_\_\_\_
- 5 Work out  $\frac{5}{6} + \frac{1}{6} + \frac{1}{3}$  \_\_\_\_\_
- 6 Work out  $\frac{2}{9} + \frac{1}{9} + \frac{1}{3}$  \_\_\_\_\_
- 7 Work out  $\frac{1}{2}$  of 48 \_\_\_\_\_
- 8 Work out  $\frac{1}{4}$  of 36 \_\_\_\_\_
- 9 Work out  $\frac{3}{4}$  of 48 \_\_\_\_\_
- 10 Work out  $\frac{2}{3}$  of 42 \_\_\_\_\_
- 11 Work out  $\frac{5}{6}$  of 36 \_\_\_\_\_

- 12 Work out  $3^5$  of 45
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- 13 Work out  $7^{10}$  of 60
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- 14 Work out  $2^7$  of 49
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- 15 Work out  $3^4 \times 4^3$
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- 16 Work out  $2^5 \times 5^2$
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- 17 Work out  $7^8 \times 8^7$
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- 18 Work out  $5^9 \times 9^5$
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**B · Reasoning — Which reorderings are allowed.**

- 19 Why is it worth cancelling before multiplying?
- ☐ It is required
  - ☐ The numbers stay small and the answer arrives simplified
  - ☐ It changes the answer
  - ☐ It is faster to multiply big numbers
- 20 For  $3/4$  of 48, which order is easier?
- ☐  $48 \times 3$  then  $\div 4$
  - ☐  $48 \div 4$  then  $\times 3$
  - ☐ They are equally hard
  - ☐ Neither works
- 21 Why does  $5/8 \times 8/5 = 1$  without any calculation?
- ☐ Because both are less than 1
  - ☐ They are reciprocals of each other
  - ☐ Because  $5 + 8 = 13$
  - ☐ It does not equal 1
- 22 In  $1/4 + 1/2 + 3/4$ , which pair should you add first?
- ☐  $1/4$  and  $1/2$
  - ☐  $1/4$  and  $3/4$
  - ☐  $1/2$  and  $3/4$
  - ☐ It makes no difference to the ease
- 23 Does changing the order of an addition change the answer?
- ☐ Yes
  - ☐ No
- 24 Does changing the order of a subtraction change the answer?
- ☐ Yes
  - ☐ No

**25** What is the best first step for  $\frac{2}{3} \times 9$ ?

- ☐ Multiply  $2 \times 9$  then divide by 3
- ☐ Divide 9 by 3 then multiply by 2
- ☐ Find a common denominator
- ☐ Convert to a decimal

### C · Challenge — Cancelling and pairing.

**26** Work out  $1^{\frac{1}{3}} + 2^{\frac{2}{3}} + 5^{\frac{5}{6}}$

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**27** Work out  $\frac{5}{6}$  of 72 by dividing first.

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**28** Work out  $4^{\frac{4}{9}} \times 3^{\frac{3}{8}}$  by cancelling first.

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**29** Work out  $\frac{7}{10}$  of 120 by dividing first.

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**30** Work out  $2^{\frac{2}{7}} \times 7^{\frac{7}{2}}$

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**31** Work out  $\frac{3}{8}$  of 64 in the easiest order.

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### D · Word problems — Fractions of quantities, done neatly.

**32** A class of 36 has  $\frac{5}{6}$  present. How many are present?

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**33** A 90-minute film is  $\frac{2}{3}$  over. How many minutes have gone?

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**34** A jug holds  $1^{\frac{1}{4}}$  litre, another  $1^{\frac{1}{2}}$  litre and a third  $3^{\frac{3}{4}}$  litre. What is the total, in litres?

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**35** A farm has 84 animals and  $\frac{3}{7}$  are sheep. How many sheep?

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**36** A book has 240 pages and  $\frac{5}{8}$  has been read. How many pages?

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**37** A shop sells  $\frac{3}{5}$  of its 75 loaves. How many loaves is that?

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**38** A journey of 210 km is  $\frac{4}{7}$  complete. How many km is that?

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**39** A tank of 96 litres is  $\frac{7}{8}$  full. How many litres?

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