

Name _____

Date _____

4.5 Making decimal calculations easier — worked answers

Simplify calculations containing decimals using place value, equivalent fractions and the order of operations. · 56 questions

A · Fluency — Use an easier method for each calculation.

- 1 Work out 0.06×3500 using an easier method.

Answer: 210

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $0.06 \times 3500 = 210$.

- 2 Work out 8.2×9 using an easier method.

Answer: 73.8

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $8.2 \times 9 = 73.8$.

- 3 Work out $12.56 \div 40$ using an easier method.

Answer: 0.314

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $12.56 \div 40 = 0.314$.

- 4 Work out 0.4×250 using an easier method.

Answer: 100

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $0.4 \times 250 = 100$.

- 5 Work out 0.25×84 using an easier method.

Answer: 21

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $0.25 \times 84 = 21$.

- 6 Work out 0.5×36 using an easier method.

Answer: 18

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $0.5 \times 36 = 18$.

- 7 Work out 1.5×48 using an easier method.

Answer: 72

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $1.5 \times 48 = 72$.

- 8 Work out 0.05×600 using an easier method.

Answer: 30

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $0.05 \times 600 = 30$.

- 9 Work out 2.5×16 using an easier method.

Answer: 40

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $2.5 \times 16 = 40$.

- 10 Work out 0.75×40 using an easier method.

Answer: 30

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $0.75 \times 40 = 30$.

- 11 Work out 0.02×4500 using an easier method.

Answer: 90

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $0.02 \times 4500 = 90$.

- 12 Work out 0.1×870 using an easier method.

Answer: 87

Rewrite the decimal in a friendlier way — as a fraction, or by partitioning — then calculate: $0.1 \times 870 = 87$.

- 13 Work out $8.2 \times (10 - 1)$

Answer: 73.8

Deal with the bracket first, or multiply out: $8.2 \times (10 - 1) = 73.8$.

- 14 Work out $7.4 \times (10 - 1)$

Answer: 66.6

Deal with the bracket first, or multiply out: $7.4 \times (10 - 1) = 66.6$.

- 15 Work out $6.5 \times (10 - 2)$

Answer: 52

Deal with the bracket first, or multiply out: $6.5 \times (10 - 2) = 52$.

- 16 Work out $4.8 \times (20 - 1)$

Answer: 91.2

Deal with the bracket first, or multiply out: $4.8 \times (20 - 1) = 91.2$.

- 17 Work out $9.6 \times (10 - 1)$

Answer: 86.4

Deal with the bracket first, or multiply out: $9.6 \times (10 - 1) = 86.4$.

- 18 Work out $3.7 \times (100 - 1)$

Answer: 366.3

Deal with the bracket first, or multiply out: $3.7 \times (100 - 1) = 366.3$.

- 19 Work out $12.5 \times (8 + 2)$

Answer: 125

Deal with the bracket first, or multiply out: $12.5 \times (8 + 2) = 125$.

- 20 Work out $2.4 \times (5 + 5)$

Answer: 24

Deal with the bracket first, or multiply out: $2.4 \times (5 + 5) = 24$.

- 21 Work out $1.8 \times (10 + 1)$

Answer: 19.8

Deal with the bracket first, or multiply out: $1.8 \times (10 + 1) = 19.8$.

- 22 Work out $5.2 \times (20 - 2)$

Answer: 93.6

Deal with the bracket first, or multiply out: $5.2 \times (20 - 2) = 93.6$.

- 23 Work out $0.9 \times (40 + 10)$

Answer: 45

Deal with the bracket first, or multiply out: $0.9 \times (40 + 10) = 45$.

- 24 Work out $6.25 \times (4 \times 4)$

Answer: 100

Deal with the bracket first, or multiply out: $6.25 \times (4 \times 4) = 100$.

B · Reasoning — Why each shortcut works.

- 25 $0.06 = 6 \div 100$. Use that to work out 0.06×3500 .

Answer: 210

$0.06 \times 3500 = 6 \div 100 \times 3500 = 6 \times (3500 \div 100) = 6 \times 35 = 210$. You may do the $\times$ and $\div$ in any order.

- 26 Use the fact that $8.2 \times 9 = 8.2 \times (10 - 1)$ to work it out.

Answer: 73.8

$8.2 \times 10 = 82$, and $8.2 \times 1 = 8.2$. So $82 - 8.2 = 73.8$.

- 27 $12.56 \div 40 = 12.56 \div 4 \div 10$. Work it out.

Answer: 0.314

$12.56 \div 4 = 3.14$, then $\div 10 = 0.314$. Splitting the 40 makes it much easier.

- 28 Which is the easiest way to work out 0.25×84 ?

- ☐ Long multiplication
- ☐ Quarter of 84
- ☐ $84 \div 0.25$
- ☐ 84×4

Answer: Quarter of 84

$0.25 = \frac{1}{4}$, so the answer is $84 \div 4 = 21$.

- 29 Which is the easiest way to work out 0.5×36 ?

- ☐ Half of 36
- ☐ Double 36
- ☐ $36 \div 0.5$
- ☐ Long multiplication

Answer: Half of 36

$0.5 = \frac{1}{2}$, so the answer is 18.

- 30** Work out 0.75×40 by thinking of 0.75 as three quarters.

Answer: 30

A quarter of 40 is 10, so three quarters is 30.

- 31** Work out 2.5×16 by doubling and halving.

Answer: 40

Double 2.5 to 5 and halve 16 to 8: $5 \times 8 = 40$. The product is unchanged.

- 32** Work out 1.5×48 by partitioning 1.5 into $1 + 0.5$.

Answer: 72

$48 + 24 = 72$.

- 33** Why does doubling one number and halving the other leave the product unchanged?

- ☐ It does not
- ☐ Because $\times 2$ and $\div 2$ cancel out
- ☐ Because the numbers are decimals
- ☐ Because the answer is even

Answer: Because $\times 2$ and $\div 2$ cancel out

$2.5 \times 16 = (2.5 \times 2) \times (16 \div 2) = 5 \times 8 = 40$.

- 34** Work out 0.02×4500 by writing 0.02 as $2 \div 100$.

Answer: 90

$2 \times (4500 \div 100) = 2 \times 45 = 90$.

- 35** Work out 0.1×870 .

Answer: 87

Multiplying by 0.1 is the same as dividing by 10: 87.

- 36** Is multiplying by 0.5 the same as dividing by 2?

- ☐ Yes
- ☐ No

Answer: Yes

0.5 is one half, so multiplying by it halves the number.

C · Challenge — Combining the methods.

- 37** Work out $0.06 \times 3500 \div 7$.

Answer: 30

$0.06 \times 3500 = 210$, and $210 \div 7 = 30$.

- 38** Work out 8.2×99 .

Answer: 811.8

$8.2 \times 100 = 820$, minus 8.2 gives 811.8.

- 39** Work out 3.7×101 .

Answer: 373.7

$3.7 \times 100 = 370$, plus 3.7 gives 373.7.

- 40** Work out 6.25×16 by doubling and halving twice.

Answer: 100

$6.25 \times 16 = 12.5 \times 8 = 25 \times 4 = 100$.

- 41** Work out 0.125×64 by thinking of 0.125 as one eighth.

Answer: 8

$64 \div 8 = 8$.

- 42** Work out $45 \div 0.5$.

Answer: 90

Dividing by a half is the same as multiplying by 2: 90. Dividing by a number less than 1 makes the answer bigger.

- 43** Work out $12 \div 0.25$.

Answer: 48

Dividing by a quarter is the same as multiplying by 4: 48.

- 44** Work out $2.5 \times 3.6 \times 4$.

Answer: 36

Do $2.5 \times 4 = 10$ first, then $10 \times 3.6 = 36$. Choosing the order carefully makes it easy.

D · Word problems — Shortcuts in real calculations.

- 45** A shop sells 3500 pencils at \$0.06 each. What is the total, in dollars?

Answer: 210

$6 \times 35 = 210$, so \$210.

- 46** A tank of 12.56 litres is shared into 40 equal cups. How much in each cup, in litres?

Answer: 0.314

$12.56 \div 4 \div 10 = 0.314$ litres.

- 47** A worker earns \$8.20 an hour and works 9 hours. How much is earned, in dollars?

Answer: 73.8

$8.2 \times 10 - 8.2 = \$73.80$.

- 48** A quarter of a 84 kg load is removed. How many kg is that?

Answer: 21

$84 \div 4 = 21$ kg.

- 49** A recipe uses 0.5 kg of flour per cake. How much for 36 cakes, in kg?

Answer: 18

Half of 36 is 18 kg.

- 50** A pipe costs \$1.50 per metre. How much for 48 m, in dollars?

Answer: 72

$48 \div 2 = 24$, so \$72.

- 51** A machine uses 0.05 litres per minute. How much in 600 minutes, in litres?

Answer: 30

$5 \times 6 = 30$ litres.

- 52** A box weighs 2.5 kg. What is the mass of 16 boxes, in kg?

Answer: 40

$5 \times 8 = 40$ kg.

- 53** A field of 40 hectares has three quarters planted. How many hectares is that?

Answer: 30

Three quarters of 40 is 30 hectares.

- 54** A shop sells 4500 stickers at \$0.02 each. What are the takings, in dollars?

Answer: 90

$$2 \times 45 = \$90.$$

- 55** A rope 870 cm long is cut to one tenth of its length. How long is the piece, in cm?

Answer: 87

$$870 \div 10 = 87 \text{ cm.}$$

- 56** A drink costs \$2.40. A group buys 10. How much do they pay, in dollars?

Answer: 24

$$2.4 \times 10 = \$24.$$