7. [Powers of 10 ×,÷]

Skill 7.1 Multiplying a whole number by 10, 100, 1000, etc.

MMBlue 1 1 2 2 3 3 4 4
MMGreen 1 1 2 2 3 3 4 4

To multiply a whole number by 10, 100, 1000, etc, simply add one, two, three, etc zeros at the end of the number.

Q. $52 \times 10 =$ **A.**

$$\begin{array}{r} 52 \\ \times\ 10 \\ \hline 520 \end{array}$$

52 × 10 means 52 groups of 10.

We put a 0 on the end of 52 to make it into groups of 10.

Q. $673 \times 100 =$ **A.**

$$\begin{array}{r} 673 \\ \times\ 100 \\ \hline 67300 \end{array}$$

673 × 100 means 673 groups of 100.

We put two 0's on the end of 673 to make it into groups of 100.

a) $475 \times 10 =$

$$\begin{array}{r} 475 \\ \times\ 10 \\ \hline 4750 \end{array}$$

b) $208 \times 10 =$

$$\begin{array}{r} 208 \\ \times\ 10 \\ \hline \end{array}$$

c) $509 \times 100 =$

$$\begin{array}{r} 509 \\ \times\ 100 \\ \hline \end{array}$$

d) $603 \times 1000 =$

$$\begin{array}{r} 603 \\ \times 1000 \\ \hline \end{array}$$

e) $9610 \times 10 =$

$$\begin{array}{r} 9610 \\ \times\ 10 \\ \hline \end{array}$$

f) $3080 \times 100 =$

$$\begin{array}{r} 3080 \\ \times\ 100 \\ \hline \end{array}$$

g) $60 \times 10{,}000 =$

$$\begin{array}{r} 60 \\ \times\ 10{,}000 \\ \hline \end{array}$$

h) $74 \times 10{,}000 =$

$$\begin{array}{r} 74 \\ \times\ 10{,}000 \\ \hline \end{array}$$

i) $470 \times 100 =$

$$\begin{array}{r} 470 \\ \times\ 100 \\ \hline \end{array}$$

j) $1800 \times 10 =$

$$\begin{array}{r} 1800 \\ \times\ 10 \\ \hline \end{array}$$

k) $62 \times 1000 =$

$$\begin{array}{r} 62 \\ \times 1000 \\ \hline \end{array}$$

l) $870 \times 1000 =$

$$\begin{array}{r} 870 \\ \times 1000 \\ \hline \end{array}$$

m) $648 \times 100 =$

$$\begin{array}{r} 648 \\ \times\ 100 \\ \hline \end{array}$$

n) $920 \times 100 =$

$$\begin{array}{r} 920 \\ \times\ 100 \\ \hline \end{array}$$

o) $12 \times 10{,}000 =$

$$\begin{array}{r} 12 \\ \times\ 10{,}000 \\ \hline \end{array}$$

p) $243 \times 1000 =$

$$\begin{array}{r} 243 \\ \times 1000 \\ \hline \end{array}$$

Skill 7.2 Dividing a whole number by 10, 100, 1000, etc.

To divide a whole number by 10, 100, 1000, etc, simply remove one, two, three, etc zeros from the end of the number. If the division is written as a fraction, simply cross off the respective zeros.

Q. $15{,}000 \div 100 =$

A.
$$\frac{15{,}000}{100}$$
$$= \frac{15{,}000^{\div 100}}{100_{\div 100}}$$
$$= \frac{15{,}0\cancel{00}}{1\cancel{00}}$$
$$= \frac{150}{1}$$
$$= 150$$

Any division can be written as a fraction.

Simplify by dividing both the numerator and denominator by 100.

Cross off the respective zeros.

a) $5000 \div 100 =$

$= \frac{50\cancel{00}}{1\cancel{00}}$

$= \frac{50}{1} = 50$

b) $320 \div 10 =$

$= \frac{32\cancel{0}}{1\cancel{0}}$

$= \frac{32}{1} =$ .....

c) $7000 \div 1000 =$

$= \frac{7\cancel{000}}{1\cancel{000}}$

$= \frac{\quad}{1} =$ .....

d) $2800 \div 10 =$

$= \frac{280\cancel{0}}{1\cancel{0}}$

$= \frac{\quad}{\quad} =$ .....

e) $13{,}000 \div 10 =$

$= \frac{13{,}000}{10}$

$=$ ..... $=$ .....

f) $40{,}000 \div 100 =$

$= \frac{40{,}000}{100}$

$=$ ..... $=$ .....

g) $51{,}000 \div 1000 =$

$= \frac{51{,}000}{1000}$

$=$ ..... $=$ .....

h) $37{,}400 \div 100 =$

$= \frac{37{,}400}{100}$

$=$ ..... $=$ .....

i) $99{,}000 \div 1000 =$

$= \frac{99{,}000}{1000}$

$=$ ..... $=$ .....

j) $34{,}000 \div 100 =$

$= \frac{34{,}000}{100}$

$=$ ..... $=$ .....

k) $80{,}000 \div 1000 =$

$= \frac{80{,}000}{1000}$

$=$ ..... $=$ .....

l) $804{,}000 \div 100 =$

$= \frac{804{,}000}{100}$

$=$ ..... $=$ .....

m) $7550 \div 10 =$

$= \frac{7550}{10}$

$=$ ..... $=$ .....

n) $15{,}000 \div 10 =$

$= \frac{15{,}000}{10}$

$=$ ..... $=$ .....

o) $240{,}000 \div 10{,}000 =$

$= \frac{240{,}000}{10{,}000}$

$=$ ..... $=$ .....

p) $75{,}000 \div 100 =$

$= \frac{75{,}000}{100}$

$=$ ..... $=$ .....

Skill 7.3 Multiplying a whole number by multiples of 10 (e.g. 30, 800, etc).

Q. $73 \times 60 =$

A.

$$\begin{array}{r} {\scriptstyle 1} \\ 73 \\ \times\ 60 \\ \hline 4380 \end{array}$$

60 means 6 groups of ten. To show groups of ten put a 0 in the units column in the answer.

Then multiplying 73 by 6 gives 438. We want 438 groups of ten, so place the 438 in front of the 0.

a) $293 \times 20 =$

$$\begin{array}{r} {\scriptstyle 1} \\ 293 \\ \times\ 20 \\ \hline 5860 \end{array}$$

b) $704 \times 80 =$

$$\begin{array}{r} 704 \\ \times\ 80 \\ \hline \end{array}$$

c) $610 \times 30 =$

$$\begin{array}{r} 610 \\ \times\ 30 \\ \hline \end{array}$$

d) $375 \times 200 =$

$$\begin{array}{r} 375 \\ \times\ 200 \\ \hline 00 \end{array}$$

e) $2680 \times 50 =$

$$\begin{array}{r} 2680 \\ \times\ 50 \\ \hline \end{array}$$

f) $106 \times 900 =$

$$\begin{array}{r} 106 \\ \times\ 900 \\ \hline \end{array}$$

g) $1700 \times 500 =$

$$\begin{array}{r} 1700 \\ \times\ 500 \\ \hline \end{array}$$

h) $460 \times 2000 =$

$$\begin{array}{r} 460 \\ \times\ 2000 \\ \hline \end{array}$$

i) $683 \times 30 =$

$$\begin{array}{r} 683 \\ \times\ 30 \\ \hline \end{array}$$

j) $240 \times 500 =$

$$\begin{array}{r} 240 \\ \times\ 500 \\ \hline \end{array}$$

k) $305 \times 600 =$

$$\begin{array}{r} 305 \\ \times\ 600 \\ \hline \end{array}$$

l) $1640 \times 80 =$

$$\begin{array}{r} 1640 \\ \times\ 80 \\ \hline \end{array}$$

m) $345 \times 2000 =$

$$\begin{array}{r} 345 \\ \times\ 2000 \\ \hline \end{array}$$

n) $6040 \times 70 =$

$$\begin{array}{r} 6040 \\ \times\ 70 \\ \hline \end{array}$$

o) $204 \times 800 =$

$$\begin{array}{r} 204 \\ \times\ 800 \\ \hline \end{array}$$

p) $57 \times 9000 =$

$$\begin{array}{r} 57 \\ \times\ 9000 \\ \hline \end{array}$$

Skill 7.4 Dividing a whole number by multiples of 10 (e.g. 20, 700, etc).

Q. $20{,}000 \div 500 =$

A. $\frac{20{,}000}{500}$

$= \frac{20{,}000^{\div 100}}{500_{\div 100}}$ — *Simplify by dividing both the numerator and denominator by 100.*

$= \frac{20{,}000}{500}$ — *Cross off respective zeros.*

$= \frac{200}{5}$ — *Then divide 5 into 200.*

$= \mathbf{40}$

Any division can be written as a fraction.

a) $2500 \div 500 =$

$= \frac{2500}{500}$

$= \frac{25}{5} = 5$

b) $320 \div 80 =$

$= \frac{320}{80}$

$= \frac{32}{8} =$ .....

c) $9000 \div 3000 =$

$= \frac{9000}{3000}$

$= \frac{\text{.....}}{3} =$ .....

d) $2800 \div 70 =$

$= \frac{2800}{70}$

$= \frac{\text{.....}}{\text{.....}} =$ .....

e) $6600 \div 300 =$

$= \frac{6600}{300}$

$=$ ..... $=$ .....

f) $27{,}000 \div 900 =$

$= \frac{27{,}000}{900}$

$=$ ..... $=$ .....

g) $42{,}000 \div 6000 =$

$= \frac{42{,}000}{6000}$

$=$ ..... $=$ .....

h) $160{,}000 \div 2000 =$

$= \frac{160{,}000}{2000}$

$=$ ..... $=$ .....

i) $8400 \div 700 =$

$= \frac{8400}{700}$

$=$ ..... $=$ .....

j) $39{,}000 \div 30 =$

$= \frac{39{,}000}{30}$

$=$ ..... $=$ .....

k) $56{,}000 \div 7000 =$

$= \frac{56{,}000}{7000}$

$=$ ..... $=$ .....

l) $9600 \div 60 =$

$= \frac{9600}{60}$

$=$ ..... $=$ .....

m) $6400 \div 400 =$

$= \frac{6400}{400}$

$=$ ..... $=$ .....

n) $18{,}000 \div 20 =$

$= \frac{18{,}000}{20}$

$=$ ..... $=$ .....

o) $45{,}000 \div 9000 =$

$= \frac{45{,}000}{9000}$

$=$ ..... $=$ .....

p) $240{,}000 \div 8000 =$

$= \frac{240{,}000}{8000}$

$=$ ..... $=$ .....

Skill 7.5 Dividing a decimal number by 10, 100, 1000, etc.

To divide a decimal number by 10, 100 or 1000, move the decimal point to the left one, two or three places, according to the number of zeros.

Q. 420 ÷ 100 =

A. *420 ÷ 100*
= 420.0 ÷ 100
= 420.0 ÷ 100
= 4.20
= 4.2

When no decimal point is shown it is always to be placed on the far right of the number. 420 can also be written as 420.0

To divide 420.0 by 100, move the decimal point two places to the left.

Q. 2.9 ÷ 1000 =

A. *2.9 ÷ 1000*
= 0002.9 ÷ 1000
= 0002.9 ÷ 1000
= 0.0029

Adding 0's either end of a decimal number does not change the number. 2.9 can also be written as 2.900 or 02.9 or 0002.9

To divide 2.9 by 1000, move the decimal point three places to the left.

a) 1350 ÷ 1000 =

= *1350.0 ÷ 1000*

= 1.35

b) 900 ÷ 1000 =

= .....

= .....

c) 62 ÷ 100 =

= .....

= .....

d) 816 ÷ 10 =

= .....

= .....

e) 3275 ÷ 100 =

= .....

= .....

f) 100 ÷ 1000 =

= .....

= .....

g) 6 ÷ 100 =

= .....

= .....

h) 86,230 ÷ 1000 =

= .....

= .....

i) 165.4 ÷ 10 =

= .....

= .....

j) 119.2 ÷ 100 =

= .....

= .....

k) 27.1 ÷ 10 =

= .....

= .....

l) 0.59 ÷ 10 =

= .....

= .....

m) 0.6 ÷ 100 =

= .....

= .....

n) 74.28 ÷ 1000 =

= .....

= .....

o) 0.08 ÷ 10 =

= .....

= .....

Skill 7.6 Multiplying a decimal number by 10, 100, 1000, etc.

To multiply a decimal number by 10, 100 or 1000, move the decimal point to the right one, two or three places, according to the number of zeros.

Q. $0.79 \times 10 =$

A. 0.79×10
$= 0.\overset{\frown}{79} \times 10$
$= \mathbf{7.9}$

To multiply 0.79 by 10, move the decimal point one place to the right.

Q. $1.35 \times 100 =$

A. 1.35×100
$= 1.\overset{\frown\frown}{35} \times 100$
$= \mathbf{135}$

To multiply 1.35 by 100, move the decimal point two places to the right.

You no longer need the decimal point, since there is no digit after it.

Q. $0.52 \times 1000 =$

A. 0.52×1000
$= 0.5200 \times 1000$
$= 0.\overset{\frown\frown\frown}{5200} \times 1000$
$= 520.0$
$= \mathbf{520}$

Adding 0's at the end of a decimal number does not change the number.
0.52 can also be written as 0.520 or 0.5200

To multiply 0.52 by 1000, move the decimal point three places to the right.

You no longer need the decimal point, since there is no digit after it. (Zero is not a digit.)

a) $0.4 \times 100 =$

$= 0.\overset{\frown\frown}{400} \times 100$

$= 40.0 = 40$

b) $0.08 \times 1000 =$

$=$ .....

$=$ .....

c) $0.9 \times 100 =$

$=$ .....

$=$ .....

d) $7.56 \times 1000 =$

$=$ .....

$=$ .....

e) $0.021 \times 1000 =$

$=$ .....

$=$ .....

f) $5.3 \times 10{,}000 =$

$=$ .....

$=$ .....

g) $0.06 \times 100 =$

$=$ .....

$=$ .....

h) $6.02 \times 10 =$

$=$ .....

$=$ .....

i) $33.65 \times 1000 =$

$=$ .....

$=$ .....

j) $4.8 \times 100 =$

$=$ .....

$=$ .....

k) $7.409 \times 10{,}000 =$

$=$ .....

$=$ .....

l) $8.5 \times 100 =$

$=$ .....

$=$ .....