

### 3. [Decimal $\times, \div$ ]

#### Skill 3.1 Multiplying a decimal number by a whole number.

MM9 1 2 2 3 3 4 4  
MM10 1 1 2 2 3 3 4 4

- Ignore any decimal points and complete the multiplication from right to left.
- Count the number of decimal places in the question.
- Move the decimal point the same number of places from the right in the answer.

**Q.**  $5.49 \times 6 =$

**A.**  $32.94$

$$\begin{array}{r} \overset{2}{5} . \overset{5}{4} \overset{9}{9} \\ \times \quad 6 \\ \hline 32.94 \end{array}$$

$6 \times 9 = 54$

carry 5, write 4

$6 \times 4 + \text{carry } 5 = 29$

carry 2, write 9

$6 \times 5 + \text{carry } 2 = 32$

write 32

2 decimal places in question so  
move decimal point 2 places from right

**a)**  $0.7 \times 4 =$

**2.8**

$$\begin{array}{r} \overset{2}{0} . \overset{7}{7} \\ \times \quad 4 \\ \hline 2.8 \end{array}$$

**b)**  $0.9 \times 8 =$

$$\begin{array}{r} \overset{7}{0} . \overset{9}{9} \\ \times \quad 8 \\ \hline .2 \end{array}$$

**c)**  $2.6 \times 7 =$

$$\begin{array}{r} \overset{4}{2} . 6 \\ \times \quad 7 \\ \hline \end{array}$$

**d)**  $4.8 \times 5 =$

$$\begin{array}{r} 4.8 \\ \times \quad 5 \\ \hline \end{array}$$

**e)**  $3.26 \times 7 =$

$$\begin{array}{r} 3.26 \\ \times \quad 7 \\ \hline \end{array}$$

**f)**  $2.08 \times 3 =$

$$\begin{array}{r} 2.08 \\ \times \quad 3 \\ \hline \end{array}$$

**g)**  $12.23 \times 6 =$

$$\begin{array}{r} 12.23 \\ \times \quad 6 \\ \hline \end{array}$$

**h)**  $1.507 \times 9 =$

$$\begin{array}{r} 1.507 \\ \times \quad 9 \\ \hline \end{array}$$

**i)**  $21.37 \times 7 =$

$$\begin{array}{r} 21.37 \\ \times \quad 7 \\ \hline \end{array}$$

**j)**  $14.3 \times 8 =$

$$\begin{array}{r} 14.3 \\ \times \quad 8 \\ \hline \end{array}$$

**k)**  $3.056 \times 9 =$

$$\begin{array}{r} 3.056 \\ \times \quad 9 \\ \hline \end{array}$$

**l)**  $48.27 \times 3 =$

$$\begin{array}{r} 48.27 \\ \times \quad 3 \\ \hline \end{array}$$

To multiply by a power of 10:

- Count the number of zeros in the power of 10.
- Move the decimal point to the right as many places as there are zeros in the power of 10.
- Add zeros as place holders, if necessary.

Example:  $4.5 \times 100 = 4.\overbrace{50}^{\text{}} \times 100 = 450$

To multiply by a multiple of 10:

- Disregard the 0's in the multiple of 10 and multiply by the remaining digit.  
(see skill 3.1, page 21)
- Move the decimal point to the right as many places as there are zeros in the multiple of 10.

**Q.**  $0.005 \times 80 =$       **A.**

$0.\overbrace{00}^{\text{}}5$	$8 \times 5 = 40$	$8 \times 0 = 0$	$8 \times 0 = 0$	$8 \times 0 = 0$
$\times \quad \quad 8$				
$0.\overbrace{040}^{\text{}}$				

$0.005 \times 80 = 0.\overbrace{040}^{\text{}} \times 10 = 0.4$

1 zero in multiple so move decimal point 1 place right

$8 \times 5 = 40$       carry 4, write 0  
 $8 \times 0 + \text{carry } 4 = 4$       write 4  
 $8 \times 0 = 0$       write 0  
 $8 \times 0 = 0$       write 0

**a)**  $6.37 \times 100 =$  2 zeros, 2 places right

$= \overbrace{637}^{\text{}} = \boxed{637}$

**b)**  $3.98 \times 10 =$        $= \overbrace{39.8}^{\text{}} = \boxed{\phantom{000}}$

**c)**  $0.03 \times 10 =$        $= \overbrace{0.3}^{\text{}} = \boxed{\phantom{000}}$

**d)**  $4.29 \times 100 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**e)**  $100 \times 3.007 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**f)**  $21.88 \times 100 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**g)**  $100 \times 0.005 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**h)**  $0.8 \times 100 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**i)**  $100 \times 0.12 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**j)**  $0.039 \times 10 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**k)**  $0.73 \times 10 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**l)**  $1000 \times 0.57 =$        $= \overbrace{0.57}^{\text{}} = \boxed{570}$

Add zeros as place holders

**m)**  $50 \times 8.6 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**n)**  $0.0058 \times 40 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**o)**  $0.64 \times 200 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**p)**  $30 \times 0.0309 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**q)**  $0.004 \times 200 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**r)**  $60 \times 0.704 =$        $= \overbrace{\phantom{000}}^{\text{}} = \boxed{\phantom{000}}$

**Skill 3.3** Multiplying a decimal number by a negative power of 10 (e.g. 0.1) MM9 1 1 2 2 3 3 4 4  
MM10 1 1 2 2 3 3 4 4

- Move the decimal point to the right in the power of 10, as many places as you need to make 1.

Example: In  $0.\widehat{01}$  the decimal point must move two places to the right to make 1.

- Then move the decimal point the same number of places to the left in the dividend.
- Add zeros as place holders, if necessary.

Example:  $2.4 \times 0.01 = \widehat{00}2.4 \times \widehat{00}0.01 = 0.024 \times 1 = 0.024$

- If the result is less than 1, write a zero in the units place.

Example: By convention 0.37 rather than .37

**Q.**  $0.01 \times 3.9 =$

**A.**  $0.01 \times 3.9$   
 $= \widehat{00}0.1 \times \widehat{00}3.9$  2 places right makes 1 so move decimal point 2 places left  
 $= 1 \times 0.039$   
 $= \mathbf{0.039}$  < 1 so write zero in units place

**a)**  $\widehat{7}84 \times 0.\widehat{1} =$

$= \widehat{0}784 \times 1 = \mathbf{0.784}$

**b)**  $\widehat{4}2 \times 0.\widehat{1} =$

$= \dots = \mathbf{\quad}$

**c)**  $0.1 \times 68.5 =$

$= \dots = \mathbf{\quad}$

**d)**  $0.01 \times 593.2 =$

$= \dots = \mathbf{\quad}$

**e)**  $484.5 \times 0.01 =$

$= \dots = \mathbf{\quad}$

**f)**  $0.01 \times 223.7 =$

$= \dots = \mathbf{\quad}$

**g)**  $0.001 \times 31.3 =$

$= \widehat{000}1 \times \widehat{00}31.3$   
 $= 1 \times 0.0313 = \mathbf{0.0313}$

Use zeros as place holders

**h)**  $0.001 \times 9090.9 =$

$= \dots = \mathbf{\quad}$

**i)**  $0.001 \times 1234.5 =$

$= \dots = \mathbf{\quad}$

**j)**  $0.01 \times 12.8 =$

$= \dots = \mathbf{\quad}$

**k)**  $32.5 \times 0.01 =$

$= \dots = \mathbf{\quad}$

**l)**  $0.01 \times 13.9 =$

$= \dots = \mathbf{\quad}$

**m)**  $530.8 \times 0.001 =$

$= \dots = \mathbf{\quad}$

**n)**  $0.01 \times 1.02 =$

$= \dots = \mathbf{\quad}$

**o)**  $5.4 \times 0.001 =$

$= \dots = \mathbf{\quad}$

### Skill 3.4 Multiplying a decimal number by a decimal number.

MM9 11 2 33 44  
MM10 11 2 33 44

- Neglect any decimal points and complete the multiplication from right to left.
- Count the number of decimal places in the question.
- Move the decimal point the same number of places from the right in the answer.
- Use zeros as place holders, if necessary.

Example:  $0.02 \times 0.3 = 0.006$

- If the result is less than 1, write a zero in the units place.

Example: By convention 0.37 not .37

- Remove any zeros at the end of the decimal number, after the decimal point, if necessary.
- Remove any zeros at the start of the decimal number, up to zero units, if necessary.

Q.  $15.4 \times 0.03 =$

A. **0.462**

$$\begin{array}{r} \overset{1}{1} \overset{1}{5} . \overset{4}{4} \\ \times 0 . \overset{0}{0} \overset{3}{3} \\ \hline 0 . \overset{4}{4} \overset{6}{6} \overset{2}{2} \end{array}$$

$3 \times 4 = 12$  carry 1, write 2  
 $3 \times 5 + \text{carry } 1 = 16$  carry 1, write 6  
 $3 \times 1 + \text{carry } 1 = 4$  write 4

< 1 so write zero in units place

3 decimal places in question so move decimal point 3 places from right

a)  $0.6 \times 0.7 =$

**0.42**

b)  $0.8 \times 0.4 =$

c)  $0.9 \times 0.5 =$

$$\begin{array}{r} \overset{4}{0} . \overset{6}{6} \\ \times 0 . \overset{7}{7} \\ \hline 0 . \overset{4}{4} \overset{2}{2} \end{array}$$

2 decimal places

2 places from right

< 1 so write zero in units place

$$\begin{array}{r} \overset{3}{0} . \overset{8}{8} \\ \times 0 . \overset{4}{4} \\ \hline 2 \end{array}$$

$$\begin{array}{r} \overset{4}{0} . \overset{9}{9} \\ \times 0 . \overset{5}{5} \\ \hline \end{array}$$

d)  $3.6 \times 0.6 =$

e)  $0.7 \times 4.58 =$

f)  $0.17 \times 0.08 =$

$$\begin{array}{r} 3 . 6 \\ \times 0 . 6 \\ \hline \end{array}$$

$$\begin{array}{r} 4 . 58 \\ \times 0 . 7 \\ \hline \end{array}$$

$$\begin{array}{r} 0 . 17 \\ \times 0 . 08 \\ \hline \end{array}$$

g)  $3.9 \times 0.09 =$

h)  $0.03 \times 2.98 =$

i)  $32.5 \times 0.09 =$

$$\begin{array}{r} 3 . 9 \\ \times 0 . 09 \\ \hline \end{array}$$

$$\begin{array}{r} 2 . 98 \\ \times 0 . 03 \\ \hline \end{array}$$

$$\begin{array}{r} 32 . 5 \\ \times 0 . 09 \\ \hline \end{array}$$

j)  $2.75 \times 6.7 =$

k)  $9.15 \times 2.3 =$

l)  $12.8 \times 0.43 =$

$$\begin{array}{r} 2 . 75 \\ \times 6 . 7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 . 15 \\ \times 2 . 3 \\ \hline \end{array}$$

$$\begin{array}{r} 12 . 8 \\ \times 0 . 43 \\ \hline \end{array}$$

### Skill 3.5 Dividing a decimal number by a whole number.

MM9 11 22 33 44  
MM10 11 22 33 44

- Break down the division into smaller divisions.
- Divide from left to right.
- Line up the decimal point in your answer with the decimal point in the question.

**Q.**  $208.2 \div 6 =$

**A.**  $34.7$

$$\begin{array}{r} 34.7 \\ 6 \overline{) 208.2} \end{array}$$

$2 \div 6 = ?$  carry 2  
 $20 \div 6 = 3$  carry 2 write 3  
 $28 \div 6 = 4$  carry 4 write 4  
 $42 \div 6 = 7$  write 7

÷ from left  
 Line up decimal places

**a)**  $163.2 \div 8 =$

**20.4**

**b)**  $76.8 \div 4 =$

**c)**  $46.5 \div 5 =$

÷ from left

$$\begin{array}{r} 20.4 \\ 8 \overline{) 163.2} \end{array}$$

$$\begin{array}{r} 19.2 \\ 4 \overline{) 76.8} \end{array}$$

$$\begin{array}{r} 9.3 \\ 5 \overline{) 46.5} \end{array}$$

Line up decimal places

**d)**  $140.4 \div 6 =$

**e)**  $145.8 \div 3 =$

**f)**  $130.9 \div 7 =$

$$\begin{array}{r} 23.4 \\ 6 \overline{) 140.4} \end{array}$$

$$\begin{array}{r} 48.6 \\ 3 \overline{) 145.8} \end{array}$$

$$\begin{array}{r} 18.7 \\ 7 \overline{) 130.9} \end{array}$$

**g)**  $31.05 \div 5 =$

**h)**  $79.48 \div 2 =$

**i)**  $96.56 \div 8 =$

$$\begin{array}{r} 6.21 \\ 5 \overline{) 31.05} \end{array}$$

$$\begin{array}{r} 39.74 \\ 2 \overline{) 79.48} \end{array}$$

$$\begin{array}{r} 12.07 \\ 8 \overline{) 96.56} \end{array}$$

**j)**  $104.24 \div 4 =$

**k)**  $153.54 \div 9 =$

**l)**  $794.78 \div 7 =$

$$\begin{array}{r} 26.06 \\ 4 \overline{) 104.24} \end{array}$$

$$\begin{array}{r} 17.06 \\ 9 \overline{) 153.54} \end{array}$$

$$\begin{array}{r} 113.54 \\ 7 \overline{) 794.78} \end{array}$$

**m)**  $201.12 \div 8 =$

**n)**  $391.26 \div 6 =$

**o)**  $150.625 \div 5 =$

$$\begin{array}{r} 25.14 \\ 8 \overline{) 201.12} \end{array}$$

$$\begin{array}{r} 65.21 \\ 6 \overline{) 391.26} \end{array}$$

$$\begin{array}{r} 30.125 \\ 5 \overline{) 150.625} \end{array}$$

### Skill 3.6 Dividing a decimal number by a power of 10.

MM9 11 22 3 44  
MM10 11 22 3 44

- Move the decimal place to the left as many places as there are zeros in the power of 10.  
Example:  $30\overline{7}2 \div 100 = 30.72$
- Add zeros as place holders, if necessary.  
Example:  $4.5 \div 100 = 00\overline{4}5 \div 100 = 0.045$
- If the result is less than 1, write a zero in the units place.  
Example: By convention 0.37 not .37

**Q.**  $0.97 \div 10 =$

**A.**  $0.97 \div 10$  *1 zero, 1 place left*  
 $= \overline{0}97 \div 10$   
 $= \mathbf{0.097}$   
*< 1 so write zero in units place*

**a)**  $6.7 \div 100 =$  *2 zeros, 2 places left*

$= \overline{00}6.7 \div 100 =$  **0.067**

*Add zeros as place holders*

**b)**  $230.6 \div 10 =$

$=$  .....  $=$

**c)**  $15.3 \div 10 =$

$=$  .....  $=$

**d)**  $3.35 \div 10 =$

$=$  .....  $=$

**e)**  $800.9 \div 100 =$

$=$  .....  $=$

**f)**  $32.4 \div 100 =$

$=$  .....  $=$

**g)**  $0.36 \div 10 =$

$= \overline{00}36 \div 10 =$

*Add zeros as place holders*

**h)**  $0.08 \div 10 =$

$=$  .....  $=$

**i)**  $65.3 \div 100 =$

$=$  .....  $=$

**j)**  $49.2 \div 100 =$

$=$  .....  $=$

**k)**  $6.8 \div 100 =$

$=$  .....  $=$

**l)**  $0.74 \div 100 =$

$=$  .....  $=$

**m)**  $2972.5 \div 1000 =$

$=$  .....  $=$

**n)**  $33.1 \div 1000 =$

$=$  .....  $=$

**o)**  $0.5 \div 1000 =$

$=$  .....  $=$

**p)**  $0.015 \div 10 =$

$=$  .....  $=$

**q)**  $0.6 \div 100 =$

$=$  .....  $=$

**r)**  $1.02 \div 100 =$

$=$  .....  $=$

**s)**  $3.25 \div 1000 =$

$=$  .....  $=$

**t)**  $42.6 \div 1000 =$

$=$  .....  $=$

**u)**  $0.23 \div 100 =$

$=$  .....  $=$

### Skill 3.7 Dividing a decimal number by a negative power of 10 (e.g. 0.1)

- Move the decimal point to the right in the power of 10, as many places as you need to make 1.

Example: In  $0.\widehat{01}$  the decimal point must move two places to the right to make 1.

- Move the decimal point the same number of places to the right in the dividend.

Example:  $4.\widehat{52} \div 0.\widehat{01} = 452 \div 1 = 452$

- Add zeros as place holders, if necessary.

Example:  $4.5 \div 0.01 = 4.\widehat{50} \div 0.\widehat{01} = 450 \div 1 = 450$

**Q.**  $0.85 \div 0.01 =$

**A.**  $0.85 \div 0.01$

$= 0.\widehat{85} \div 0.\widehat{01}$  *2 places right makes 1*

$= 85 \div 1$  *so 2 places right*

$= 85$

**a)**  $5.\widehat{6} \div 0.\widehat{1} =$

$= 56 \div 1 =$

**b)**  $3.03 \div 0.1 =$

$=$    $=$

**c)**  $2.4 \div 0.1 =$

$=$    $=$

**d)**  $0.058 \div 0.1 =$

$=$    $=$

**e)**  $42.7 \div 0.1 =$

$=$    $=$

**f)**  $0.38 \div 0.1 =$

$=$    $=$

**g)**  $0.76 \div 0.01 =$

$=$    $=$

**h)**  $0.09 \div 0.01 =$

$=$    $=$

**i)**  $65.3 \div 0.01 =$

$=$    $=$

**j)**  $0.005 \div 0.01 =$

$=$    $=$

**k)**  $0.89 \div 0.01 =$

$=$    $=$

**l)**  $7.153 \div 0.001 =$

$=$    $=$

**m)**  $0.048 \div 0.1 =$

$=$    $=$

**n)**  $12.4 \div 0.1 =$

$=$    $=$

**o)**  $0.75 \div 0.01 =$

$=$    $=$

**p)**  $1.2 \div 0.01 =$

$= 1.\widehat{20} \div 0.\widehat{01}$  *Add zeros as place holders*  
 $= 120 \div 1 =$

**q)**  $23.2 \div 0.01 =$

$=$    $=$

**r)**  $3.58 \div 0.001 =$

$=$    $=$

**s)**  $0.4 \div 0.01 =$

$=$    $=$

**t)**  $0.03 \div 0.001 =$

$=$    $=$

**u)**  $8.04 \div 0.001 =$

$=$    $=$

### Skill 3.8 Dividing a decimal number by a decimal number.

MM9 11 22 33 44  
MM10 11 22 33 44

- Move the decimal point to the right in the divisor, as many places as you need to make it a whole number.
  - Then move the decimal point the same number of places to the right in the dividend.
- Example:  $4.5\overline{3} \div 0.0\overline{2} = 453.0 \div 2 = 226.5$
- Add zeros as place holders, if necessary.
- Example:  $3.6 \div 0.06 = 3.6\overline{0} \div 0.0\overline{6} = 360 \div 6 = 60$  (See also example above.)
- Break down the division into smaller divisions.
- Divide from left to right.
- Line up the decimal point in your answer with the decimal point in the question.

**Q.**  $3.68 \div 0.8 =$

**A.**  $3.6\overline{8} \div 0.8\overline{}$   
 $= 36.8 \div 8$   
 $= 4.6$

1 place right makes a whole number

**a)**  $9.8\overline{4} \div 0.8\overline{}$  =  $98.4 \div 8$  = 12.3

**b)**  $0.6 \div 0.2 =$  =  

**c)**  $2.8 \div 0.4 =$  =  

**d)**  $0.03 \div 0.003 =$  =  

**e)**  $4.68 \div 0.4 =$  =  

**f)**  $8.61 \div 0.7 =$  =  

**g)**  $35.6 \div 3.56 =$  =  

**h)**  $5.68 \div 0.8 =$  =  

**i)**  $13.35 \div 0.5 =$  =  

**j)**  $2.4 \div 0.06 =$  =  

**k)**  $0.4 \div 0.004 =$  =  

**l)**  $0.2 \div 0.25 =$  =  

**m)**  $3.675 \div 0.15 =$  =  

**n)**  $37.8 \div 1.2 =$  =  

**o)**  $1.75 \div 1.4 =$  =

### Skill 3.9 Dividing a whole number by a decimal number.

MM9 11 22 33 44  
MM10 11 22 33 44

- Move the decimal point to the right in the divisor, as many places as you need to make a whole number.
- Then move the decimal point the same number of places to the right in the dividend.

Example:  $45 \div 0.02 = 45.\widehat{00} \div 0.\widehat{02} = 4500 \div 2 = 2250$

- Add zeros as place holders, if necessary.

Example:  $36 \div 0.6 = 36.\widehat{0} \div 0.\widehat{6} = 360 \div 6 = 60$  (See also example above)

- Break down the division into smaller divisions.
- Divide from left to right.
- Line up the decimal point in your answer with the decimal point in the question.

**Q.**  $60 \div 0.2 =$

**A.**  $60 \div 0.2$   
 $= 60.\widehat{0} \div 0.\widehat{2}$  *1 place right makes a whole number*  
 $= 600 \div 2$  *Add zeros as place holders*  
 $= 300$

$$\begin{array}{r} 300 \\ 2 \overline{) 600} \end{array}$$

*÷ from left*

*2 places right make a whole number*

**a)**  $9 \div 0.03 =$

$= 9.\widehat{00} \div 0.\widehat{03} =$  300

$$\begin{array}{r} 300 \\ 3 \overline{) 900} \end{array}$$

*Add zeros as place holders*

**b)**  $7 \div 0.02 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ 2 \overline{) \phantom{00}} \end{array}$$

**c)**  $80 \div 0.4 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$

**d)**  $27 \div 0.9 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$

**e)**  $18 \div 0.04 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$

**f)**  $32 \div 0.8 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$

**g)**  $45 \div 0.05 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$

**h)**  $50 \div 0.25 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$

**i)**  $60 \div 0.12 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$

**j)**  $30 \div 0.15 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$

**k)**  $96 \div 0.8 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$

**l)**  $14 \div 0.5 =$

$=$   

$$\begin{array}{r} \phantom{00} \\ \phantom{0} \overline{) \phantom{00}} \end{array}$$