

# 6:09 | Multiplication and Division of Surds

Name: \_\_\_\_\_

Class: \_\_\_\_\_

## Examples



Basic rules:

$$\sqrt{a} \times \sqrt{b} = \sqrt{ab} \quad \sqrt{a} \div \sqrt{b} = \sqrt{a \div b} \quad \sqrt{a} \times \sqrt{a} = a$$

Simplify.

1  $\sqrt{3} \times \sqrt{3} = 3$

2  $5\sqrt{6} \times \sqrt{6} = 5 \times 6 = 30$

3  $\sqrt{7} \times \sqrt{15} = \sqrt{105}$

4  $2\sqrt{6} \times \sqrt{3} = 2\sqrt{18} = 2 \times 3\sqrt{2} = 6\sqrt{2}$

5  $\sqrt{30} \div \sqrt{2} = \sqrt{15}$

6  $\sqrt{45} \div \sqrt{5} = \sqrt{9} = 3$

## Exercise

1 Simplify.

a  $\sqrt{7} \times \sqrt{5}$

b  $2\sqrt{3} \times 3\sqrt{2}$

c  $\sqrt{6} \times \sqrt{11}$

d  $6\sqrt{3} \times 3\sqrt{5}$

e  $3\sqrt{2} \times \sqrt{2}$

f  $\sqrt{10} \times \sqrt{3}$

g  $\sqrt{7} \times 4\sqrt{7}$

h  $4\sqrt{5} \times 2\sqrt{6}$

i  $\sqrt{8} \times \sqrt{2}$

j  $\sqrt{10} \times \sqrt{2}$

k  $2\sqrt{5} \times 4\sqrt{5}$

l  $\sqrt{3} \times \sqrt{12}$

m  $\sqrt{5} \times \sqrt{10}$

n  $3\sqrt{6} \times 2\sqrt{7}$

o  $\sqrt{10} \times 3\sqrt{10}$

p  $8\sqrt{3} \times 6\sqrt{7}$

q  $4\sqrt{3} \times 3\sqrt{3}$

r  $3\sqrt{2} \times 2\sqrt{6}$

s  $\sqrt{3} \times \sqrt{21}$

t  $2\sqrt{3} \times \sqrt{15}$

2 Simplify.

a  $\sqrt{20} \div \sqrt{5}$

b  $\sqrt{30} \div \sqrt{6}$

c  $\sqrt{60} \div \sqrt{5}$

d  $\sqrt{20} \div \sqrt{10}$

e  $\sqrt{26} \div \sqrt{2}$

f  $\sqrt{15} \div \sqrt{3}$

g  $8\sqrt{10} \div \sqrt{2}$

h  $6\sqrt{10} \div 3\sqrt{2}$

i  $\sqrt{18} \div \sqrt{2}$

j  $14\sqrt{18} \div 7\sqrt{2}$

k  $5\sqrt{7} \div \sqrt{7}$

l  $12\sqrt{6} \div 4\sqrt{2}$

m  $5\sqrt{8} \div \sqrt{2}$

n  $\sqrt{32} \div \sqrt{2}$

o  $4\sqrt{24} \div \sqrt{8}$

p  $15\sqrt{40} \div 5\sqrt{8}$

## Fun Spot 6:09 | Which detective sings quietly while solving crimes?



Rewrite each as a simplified surd.

Match the letters with the answers below.

C  $\sqrt{18}$

E  $\sqrt{12}$

H  $\sqrt{24}$

K  $\sqrt{32}$

L  $\sqrt{40}$

M  $\sqrt{48}$

O  $\sqrt{50}$

R  $\sqrt{52}$

S  $\sqrt{60}$

U  $\sqrt{72}$

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|--|--|--|--|--|--|--|--|

$2\sqrt{15} \quad 2\sqrt{6} \quad 2\sqrt{3} \quad 2\sqrt{13} \quad 2\sqrt{10} \quad 5\sqrt{2} \quad 3\sqrt{2} \quad 4\sqrt{2}$

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$2\sqrt{6} \quad 6\sqrt{2} \quad 4\sqrt{3} \quad 2\sqrt{15}$

### 6:09 Multiplication and Division of Surds

- |                 |                 |               |                 |               |               |                |
|-----------------|-----------------|---------------|-----------------|---------------|---------------|----------------|
| 1 a $\sqrt{35}$ | b $6\sqrt{6}$   | c $\sqrt{66}$ | d $18\sqrt{15}$ | e 6           | f $\sqrt{30}$ | g 28           |
| h $8\sqrt{30}$  | i 4             | j $2\sqrt{5}$ | k 40            | l 6           | m $5\sqrt{2}$ | n $6\sqrt{42}$ |
| o 30            | p $48\sqrt{21}$ | q 36          | r $12\sqrt{3}$  | s $3\sqrt{7}$ | t $6\sqrt{5}$ |                |
| 2 a 2           | b $\sqrt{5}$    | c $2\sqrt{3}$ | d $\sqrt{2}$    | e $\sqrt{13}$ | f $\sqrt{5}$  | g $8\sqrt{5}$  |
| h $2\sqrt{5}$   | i 3             | j 6           | k 5             | l $3\sqrt{3}$ | m 10          | n 4            |
| o $4\sqrt{3}$   | p $3\sqrt{5}$   |               |                 |               |               |                |