

- [HOME](#)
- [Year 5 »](#)
- [Year 6 »](#)
- [Year 7 »](#)
- [Year 8 »](#)
- [Year 9 »](#)

# Supporting Australian Mathematics Project

## Middle Years SAM-MY



## Year 9

### Number and Algebra

#### Indices

Introduction | **Teacher resources** | Student resources

Index laws

#### The zero index

Clearly,  $\frac{5^3}{5^3} = 1$ . On the other hand, applying index law 2, ignoring the condition  $m > n$ , we have  $= 5^0$ . If

the index laws are to be applied in this situation, then we need to define  $5^0$  to be 1.

More generally, if  $a \neq 0$  then we define  $a^0 = 1$ .

Note that  $0^0$  is not defined. It is sometimes called an **indeterminant** form.

#### Example 5

Simplify  $(2xy^2)^0 \times (3x^2y)^3$

#### Solution

$$\begin{aligned} (2xy^2)^0 \times (3x^2y)^3 &= 1 \times 3^3 x^6 y^3 \\ &= 27x^6 y^3 \end{aligned}$$

Teacher  
5  
8  
9  
6



This publication is funded by the  
Australian Government Department of Education,  
Employment and Workplace Relations

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