



Indices and Index Laws

Warm up

- $2^2 =$
- $29^0 =$
- $5^2 =$
- $25^1 =$
- $10^3 =$
- $8^2 =$
- $11^2 =$
- $10^2 =$
- $6^0 =$
- $30^1 =$

Stage 1

- Write the following out in full, e.g. $2^3 = 2 \times 2 \times 2$
 - $5^2 =$
 - $9^5 =$
 - $12^3 =$
 - $20^2 =$
 - $8^4 =$
 - $7^6 =$
- Write the following using index notation, e.g. $4 \times 4 \times 4 = 4^3$
 - $5 \times 5 =$
 - $6 \times 6 \times 6 \times 6 \times 6 =$
 - $0.5 \times 0.5 \times 0.5 \times 0.5 =$
 - $9 \times 9 \times 9 =$
 - $20 \times 20 \times 20 \times 20 \times 20 \times 20 \times 20 \times 20 =$
 - $a \times a \times a \times a \times a =$
- Match each of the following

| | |
|---------|---|
| 8^2 | 100 |
| 10^5 | $9 \times 9 \times 9 \times 9 \times 9 \times 9$ |
| 100^1 | 8×8 |
| 15^6 | $8 \times 8 \times 8 \times 8$ |
| 9^7 | $10 \times 10 \times 10$ |
| 8^4 | 32×32 |
| 32^2 | $9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9$ |
| 10^3 | $10 \times 10 \times 10 \times 10 \times 10$ |
| 9^6 | $15 \times 15 \times 15 \times 15 \times 15 \times 15$ |

Stage 2

Simply the following:

1. $3^2 \times 3^4 =$

2. $8^3 \times 8^2 =$

3. $\frac{6^7}{6^3} =$

4. $10^8 \times 10^3 =$

5. $\frac{3^8}{3^6} =$

6. $4^5 \times 4^1 =$

7. $\frac{18^5}{18^4} =$

8. $\frac{x^{12}}{x^9} =$

9. $g^3 \times g^3 =$

10. $\frac{a^{20}}{a^{16}} =$

11. $2^1 \times 2^8 =$

12. $\frac{9^7}{9^5} =$

13. $d^5 \times d^4 =$

Stage 3

Simply the following:

1. $(c^2)^3 =$

2. $(g^5)^4 =$

3. $\frac{m^4}{m \times m^3} =$

4. $\frac{p^9}{p^3 \times p^2} =$

5. $(k^8)^4 =$

6. $\frac{h^9 \times h^2}{h^4} =$

7. $(t^3)^5 =$

8. $\frac{a^3 \times a^4}{a^2} =$

9. $\frac{32x^8}{4x^2} =$

10. $\frac{72y^9}{8y^5} =$

11. $\frac{(a^3)^9}{a^4} =$

Stage 4

1. $2^4 = y^2$, find the value of y

2. $5^6 = a^2$, find the value of a

3. $8^{10} = c^5$, find the value of c

4. $3^{15} = b^3$, find the value of b

5. $3^{12} = r^3$, find the value of r

6. $7^5 = b^2$, find the value of b

7. $6^8 = z^4$, find the value of z

8. $9^{21} = d^7$, find the value of d