

6:01 | The Index Laws

Name: _____ Class: _____

Examples



- Add indices when multiplying.
- Subtract indices when dividing.
- Multiply indices when raising to a power.
- Treat numbers as numbers.

1 Evaluate 4^3 .

$$4^3 = 4 \times 4 \times 4 \\ = 64$$

2 Evaluate 7^6 .

Press 7 $\boxed{x^y}$ 6 $\boxed{=}$
 $\therefore 7^6 = 117\,649$

3 Simplify using index laws.

a $10^8 \times 10^7$
 $= 10^{8+7}$
 $= 10^{15}$

b $a^{12} \div a^4$
 $= a^{12-4}$
 $= a^8$

c $(m^7)^2$
 $= m^{7 \times 2}$
 $= m^{14}$

d $6h^4 \times 3h^6$
 $= (6 \times 3) \times h^{4+6}$
 $= 18h^{10}$

Exercise

1 Evaluate.

a 2^3

b 3^4

c 5^3

d 8^2

e 2^5

2 Use your calculator to evaluate.

a 6^3

b 4^5

c 8^4

d 7^4

e 9^5

f 18^3

g 6^5

h 10^5

i 3^7

j 2^{14}

3 Simplify, using index laws.

a $6^7 \times 6^4$

b $c^{14} \div c^{10}$

c $x^5 \times x^4$

d $(a^4)^3$

e $(2^5)^4$

f $8^{15} \div 8^5$

g $r^3 \times r^2$

h $m^{10} \div m^9$

i $n^{20} \div n^8$

j $(y^6)^5$

k $x^6 \times x$

l $q^9 \div q$

m $w^7 \times w^3$

n $p^5 \div p^3$

o $(g^3)^2$

p $d \times d^2$

4 Simplify, using index laws where applicable.

a $3h^5 \times 2h^2$

b $4a^3 \times 10a$

c $(3x^4)^2$

d $10c^5 \div 2c^2$

e $12k^4 \div k$

f $8y^3 \times 2y^{10}$

g $10x \times 8x^6$

h $(4p^2)^3$

i $(5d^4)^3$

j $27c^8 \div 9c^7$

k $(7m^5)^3$

l $3t^7 \times 7t^3$

m $24j^{10} \div 6j^4$

n $(10y^3)^3$

o $40x^{15} \div 2x^3$

p $\frac{1}{2}n^8 \times 6n$

6:01 The Index Laws

1 a 8	b 81	c 125	d 64	e 32				
2 a 216	b 1024	c 4096	d 2401	e 59049	f 5832	g 7776	h 100000	
i 2187	j 16384							
3 a 6^{11}	b c^4	c x^9	d a^{12}	e 2^{20}	f 8^{10}	g r^5	h m	
i n^{12}	j y^{30}	k x^7	l q^8	m w^{10}	n p^2	o g^6	p d^3	
4 a $6h^7$	b $40a^4$	c $9x^8$	d $5c^3$	e $12k^3$	f $16y^{13}$	g $80x^7$	h $64p^6$	
i $125d^{12}$	j $3c$	k $343m^{15}$	l $21t^{10}$	m $4j^6$	n $1000y^9$	o $20x^{12}$	p $3n^9$	