

Algebraic techniques

UNIT 4: Index notation and algebra

Excel Intermediate
Years 9-10
pages 22-23

QUESTION 1 Simplify the following products.

- a $x^6 \times x^4 =$ _____
 b $a^5 \times a^7 =$ _____
 d $y \times y^6 =$ _____
 e $n^4 \times n^{11} =$ _____
 g $4x^5 \times 7x^3 =$ _____
 h $6a^9 \times 4a^7 =$ _____
 j $m^7 \times m^5 \times m^4 =$ _____
 k $a^4b^5 \times a^3b^2 =$ _____
 l $5xy \times 4x^2y^3 \times 3x^3y^3 =$ _____

- c $m^3 \times m^8 =$ _____
 f $a^3 \times a^4 \times a^2 =$ _____
 i $3a^5 \times 4a^6 =$ _____

QUESTION 2 Simplify these divisions.

- a $a^9 \div a^6 =$ _____
 b $x^{10} \div x^4 =$ _____
 d $24x^7 \div 8x^4 =$ _____
 e $y^9 \div y^6 \div y =$ _____
 g $36y^{12} \div 12y^5 =$ _____
 h $25x^8 \div 5x^6 =$ _____
 j $x^8y^5 \div x^4y^4 =$ _____
 k $32x^9 \div 8x^7 =$ _____

- c $n^{15} \div n^{11} =$ _____
 f $n^7 \div n^3 \div n =$ _____
 i $30a^4b^5 \div 15a^2b^2 =$ _____
 l $20x^{16} \div 5x^{12} =$ _____

QUESTION 3 Simplify these expressions.

- a $(a^2)^4 =$ _____
 b $(x^7)^5 =$ _____
 d $(m^3)^2 =$ _____
 e $(n^4)^7 =$ _____
 g $a^0 =$ _____
 h $(5y)^0 =$ _____
 j $x^0 + 6y^0 - (3z)^0 =$ _____
 k $7(x^2)^0 \times 2(y^4)^0 =$ _____

- c $(y^4)^2 =$ _____
 f $(4p^3)^2 =$ _____
 i $(9x^0)^2 =$ _____
 l $-12p^0 =$ _____

QUESTION 4 Use the index laws to simplify the following.

- a $8a^4b^3 \times 6a^2b^4 =$ _____
 b $9t^6 \times 5t^4y^2 =$ _____
 d $a^{3x} \times a^{4x} =$ _____
 e $a^{12}b^8 \div a^9b^5 =$ _____
 g $x^5y^9 \div x^3y^4 =$ _____
 h $x^{9m} \div x^{4m} =$ _____
 c $a^3 \times a^4 \times a^5 =$ _____
 f $m^{10}n^9 \div m^7n^5 =$ _____
 i $e^{6x} \div e^{4x} =$ _____

QUESTION 5 Simplify the following.

- a $5(a^3)^2 \times 6a^0 =$ _____
 b $(4a^2b^2)^3 \div 16a^2b^2 =$ _____
 d $(6a^2)^2 \div 8a^4 =$ _____
 e $(12a)^2 \div (6b)^2 =$ _____
 g $(x^7)^2 \div x^5 =$ _____
 h $a^3b^2 \times a^2b^2 \times ab =$ _____
 c $a^{24} \div a^{12} \div a^4 =$ _____
 f $12ab \times 4a \times b =$ _____
 i $64x^2y^2z \div 16x^2y^2 =$ _____

QUESTION 6 Use the index laws to simplify the following.

- a $3x^3y^2 \times 4x^5y^7 =$ _____
 b $7a^7b^3 \times 7a^6b^4 =$ _____
 c $(7x^2y^3)^0 =$ _____
 d $(9xy)^0 + 9(xy)^0 =$ _____
 e $14a^6 \div 7a^4 =$ _____
 f $a^7b^4 \times (a^2b)^3 \div a^6 =$ _____
 g $\left(\frac{5a^2b^3}{c^2}\right)^2 =$ _____
 h $\left(\frac{3x^4}{y^2}\right)^3 =$ _____
 i $\left(\frac{a^3}{2b^3}\right)^2 \times \left(\frac{5a}{3b}\right)^3 =$ _____