Expanding and simplifying algebraic expressions worksheet pdf

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Simplify the Expressions – No Exponents   Worksheet # 3

1.) $-4(8x-4) + 3x$

2.) $8 - 5(1 + 3n)$

3.) $-3(x+5) - 6$

4.) $-8x-7(8 + 7x)$

5.) $5x-4(8x-1)$

6.) $-2 +2(2x+7)$

7.) $-5(x+7) - 4$

8.) $-5(x+7) - 4$

9.) $6 -(7 + 6x)$

10.) $8(4x+6) + 6x$

Simplifying Exponential Expressions

Simplify the following expressions.

1) $\dfrac{14a^{-10}}{7a^{-8}}$

2) $(-19t^4)(-5t^5)$

_____   _____

3) $(-3m^{-7})(9m^{14})$

4) $\dfrac{2s^9}{18s^{-6}}$

_____   _____

5) $\dfrac{6n^8}{8n^7}$

6) $(6z^{10})(11z^{-2})$

_____   _____

7) $(15v^{-9})(-2v^{-3})$

8) $\dfrac{20u^{-4}}{5u^{12}}$

_____   _____

Simplifying Algebraic Fractions (A)

Name: _____   Date: _____

Simplify each expression as a single fraction.

1. $\frac{4x}{6} + \frac{x+3}{6}$

2. $\frac{8x}{3} + \frac{x-2}{9}$

3. $\frac{4x}{8} - \frac{x}{6}$

4. $\frac{9x}{8} - \frac{x-1}{8}$

5. $\frac{6x}{4} + \frac{x-2}{7}$

6. $\frac{8x}{9} + \frac{x+3}{4}$

7. $\frac{4x}{7} - \frac{x-1}{9}$

8. $\frac{5x}{7} - \frac{x-3}{3}$

9. $\frac{9x}{3} + \frac{x-3}{5}$

10. $\frac{5x}{8} + \frac{x+1}{6}$

Lesson Objective:
Know how to expand and simplify algebraic
expressions (Level 5/6)

Expand:

$2x(x + 7)$ $2c(c - 6)$ $4r(2r + 5)$ $3n(2x + 2)$

How do you know your math tutor is hungry?

Directions: Simplify each expression. Then write the letter above the corresponding answer in order to solve the riddle!

W. $-2(x + 3)$

I. $3(x + 2) + 3$

O. $6x + 3 - 2x - 7$

F. $7x + 3y - 5x + y$

R. $3 + 4(x + 5)$

H. $5(2x + 3y)$

L. $x - 3(x - 1)$

K. $5x - 6y + 2x + 6y$

E. $4 + 3(2 - 3x)$

P. $2(x - 1) + 4(2x + 1)$

Expanding and simplifying algebraic expressions worksheet pdf. Expanding and simplifying algebraic expressions worksheets. Algebraic expressions class 7 exercises. Examples simplifying algebraic expressions.

Here we will learn how to expand and simplify algebraic expressions. First we expand the brackets, then we collect the like terms to simplify the expression. At the end you'll find expanding brackets worksheets based on Edexcel, AQA and OCR exam questions, along with further guidance on where to go next if you're still stuck. In order to expand and simplify an expression, we need to multiply out the brackets and then simplify the resulting expression by collecting the like terms. Expanding brackets (or multiplying out) is the process by which we remove brackets. It is the reverse process of factorisation. To expand brackets we multiply everything outside of the bracket, by everything inside of the bracket. Once we have expanded the brackets we can simplify the expression by collecting the like terms. E.g. If we expand and simplify we will get \[2(x + 5) + 3(x − 2) = 2x + 10 + 3x − 6\] Download free expand and simplify worksheets with 20+ reasoning and applied questions, answers and mark scheme. DOWNLOAD FREE x Download free expand and simplify worksheets with 20+ reasoning and applied questions, answers and mark scheme. DOWNLOAD FREE 'Multiplying out brackets' is another term for expanding brackets. It means exactly the same thing. "Expand the brackets" is the same as "multiply out the brackets", it just gives the additional clue that when we expand brackets, we are multiplying everything outside the brackets by everything inside the brackets. In order to expand and simplify brackets: Expand each bracket in the expression.Collect the like terms. There are three ways to expand and simplify brackets: single bracketstwo or more bracketssurds Expand and simplify with single brackets. Expand the brackets to give the following expression: E.g. 2(x + 5) + 3(x − 1) = 2x + 10 + 3x − 3) = 5x + 7 Remember: expressions with two terms like 5x + 7 are known as binomials. 2Expand and simplify with two or more brackets. Expand the brackets to give the following expression: E.g. (x + 5)(x − 1) = x2 + 5x − x − 5 = x2 + 4x − 5 Remember: expressions with three terms like x2 + 4x − 5 are known as trinomials. An expression that contains more than two terms and includes variables and coefficients is called a polynomial. 3 Expand and simplify with surds. E.g. (3 + √5)(2 + √5) = 6 + 3√5 + 2√5 + √5√5 = 11 + 5√5 To expand a single bracket we multiply the term outside of the bracket by everything inside of the bracket. We can simplify the expression by collecting the like terms. Expand and simplify: 2(x + 5) + 3(x − 2) Expand each bracket in the expression Multiply the first bracket: Multiply the second bracket – remember we are multiplying both x and − 2 by + 3: Remember to include the - sign in front of the number. 2(x + 5) + 3(x − 2) = 2x + 10 + 3x − 6 = 5x + 4 Expand and simplify: 2x(x + 6) - 3(x - 2) Expand each bracket in the expression. Multiply the first bracket: Multiply the second bracket – remember we are multiplying both x and − 2 by − 3: − × − = + so − 3 × − 2 gives a positive answer. We need to write + 6. 2x(x + 6) − 3(x − 2) = 2x2 + 12x − 3x + 6 The only 'like terms' we have are the two x terms (+12x and -3x). Highlight them both. 12x2 + 12x - 3x + 6 12x - 3x = 9x = 12x2 + 9x + 6 Expand and simplify: 3(2x − 6y) − 5(x − 2y) Expand each bracket in the expression. Multiply the first bracket: + × − = − so 3 × − 6y gives a negative answer. We need to write − 18y. Multiply the second bracket, remember we are multiplying both x and − 2y by − 5: − × − = + so − 5 × − 2y gives a positive answer. We need to write + 10y. 3(2x − 6y) − 5(x − 2y) = 6x − 18y − 5x + 10y Highlight the two x terms (6x and − 5x) and the two y terms (− 18y and + 10y). Remember to highlight the sign in front of the number too! 6x − 18y − 5x + 10y 6x − 5x = 1x = x − 18y + 10y = − 8y = x − 18y + 10y = − 8y = x − 8y Practice expand and simplify questions (with single brackets) 3(x+7)-2(x+3) Expand each bracket 3x+21-2x-6 Collect like terms x+15 8(y-5)-5(y-2) Expand each bracket 8y-40-5y+10 Collect like terms 3y-30 5x(3x-2)-4x(2x+3) Expand each bracket 15x^{2}-10x-8x^{2}-12x Collect like terms 7x^{2}-22x 5(6x-2y)-2(8x-5y) Expand each bracket 30x-10y-16x+10y Collect like terms 14x To expand two or more brackets we multiply every term in the first bracket by every term in each of the other brackets. Expand and simplify: (x + 5)(x − 1) Expand the brackets in the expression. x × x = x2 x × − 1 = − x × − × − = − so the answer is negative. x × 5 = 5x 5 × − 1 = − 5 × − 1 = − x × − × − = − so the answer is negative. (x + 5)(x − 1) = x2 − x + 5x − 5 2Collect the like terms. The only like terms we have are the two x terms (− x and + 5x). Highlight them both. x2 − x + 5x − 5 = x2 + 4x − 5 Expand and simplify: (2x − 4)(x + 5) Expand the brackets in the expression. ×x+ 52x2x2+ 10x− 4x− 4x− 20 2x × x = 2x2 2x × 5 = 10x x × − 4 = − 4x + × − = − so the answer is negative. 5 × − 4 = − 20 + × − = − so the answer is negative. (2x − 4)(x + 5) = 2x2 + 10x − 4x − 20 The only like terms we have are the two x terms (+ 10x and − 4x). Highlight them both. 2x2 + 10x − 4x − 20 = 2x2 + 6x − 20 Expand and simplify: (x + 3)2(x − 1) Expand and simplify the first two brackets in the expression. (x + 3)2 = (x + 3)(x + 3) x × x = x2 x × 3 = 3x x × 3 = 3x 3 × 3 = 9 x2 + 3x + 3x + 9 = x2 + 6x + 9 Multiply this new expression with the third bracket and then simplify by collecting like terms. ×x2+ 6x+ 9x3+ 6x2+ 9x− 1− x2− 6x− 9 x × x2 = x3 x × 6x = 6x2 x × 9 = 9x − 1 × x2 = − x2 − 1 × 6x = − 6x − 1 × 9 = − 9 x3 + 6x2 − x2 + 9x − 6x − 9 = x3 + 5x2 + 3x − 9 Practice expand and simplify questions (with two or more brackets) (x+3)(x-7) Expand the brackets x^{2}-7x+3x-21 and collect like terms x^{2}-4x-21 (2x-4)(x-9) Expand the brackets 2x^{2}-18x-4x+36 and collect like terms 2x^{2}-22x+36 (x-3)^{2}(2x+1) can be written as (x-3)(x-3)(2x+1) Expanding the first two brackets gives (x^{2}-3x-3x+9)(2x+1) (x^{2}-6x+9)(2x+1) then expanding again 2x^{3}+x^{2}-12x^{2}-6x+18x+9 and collecting like terms 2x^{3}-11x^{2}+12x+9 (2x-1)^{3} can be written as (2x-1)(2x-1)(2x-1) Expanding two of the brackets gives (2x-1)(4x^{2}-2x-2x+1) (2x-1)(4x^{2}-4x+1) and expanding again 8x^{3}-8x^{2}+2x-4x^{2}+4x-1 then collect like terms 8x^{3}-12x^{2}+6x-1 To expand the brackets we need to multiply each term by every other term. Expand and simplify: (3 + √5)(2 + √5) Expand the brackets in the expression. ×2+ √536+ 3√5+ √5+ 2√5+ 5 3 × 2 = 6 3 × √5 = 3√5 2 × √5 = 2√5 √5 × √5 = 5 = 6 + 3√5 + 2√5 + 5 2Collect the like terms. Highlight the two constant terms (6 and 25) and highlight the two surd terms (3√5 and 2√5). 6 + 3√5 + 2√5 + 25 = 11 + 5√5 Expand and simplify: (√2 + √5)2 − (3 + √5)2 Expand the brackets in the expression. (√2 + √5)2 = (√2 + √5)(√2 + √5) ×√2+ √522+ √10+ √5+ √10 + √10 5 2 + √10 + √10 5 = 7 + 2√10 Expand and simplify: (3 + √5)2 = (3 + √5)(3 + √5) ×3+ √539+ 3√5+ √5+ 3√5+ 5 9 + 3√5 + 3√5 + 5 = 14 + 6√5 Now we will subtract the two answers. Remember because we are taking away all of (14 + 6√5) we need to use brackets. = 7 + 2√10 − (14 + 6√5)= 7 + 2√10 − 14 − 6√5 You are here: Home → Worksheets → Simplify expressions With this worksheet generator, you can make printable worksheets for simplifying variable expressions for pre-algebra and algebra 1 courses. The worksheets can be made either as PDF or html files (the latter are editable in a word processor). The expressions include ones where you need to combine like terms (such as 2t − 9 − 6t + 2), use the distributive property (such as 9 − 2(x + 7)), and to multiply and divide monomials, such as 2x2 · (−5x3) and −4x2 · y2 / 3x5. Basic instructions for the worksheets Each worksheet is randomly generated and thus unique. The answer key is automatically generated and is placed on the second page of the file. You can generate the worksheets either in html or PDF format — both are easy to print. To get the PDF worksheet, simply push the button titled "Create PDF" or "Make PDF worksheet". To get the worksheet in html format, push the button "View in browser" or "Make html worksheet". This has the advantage that you can save the worksheet directly from your browser (choose File → Save) and then edit it in Word or other word processing program. 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