

Factor Link

Turn a sum into a product.

GRADE 8 • MA.8.AR.1.3

MA.8.AR.1.3 "Rewrite the sum of two algebraic expressions having a common monomial factor as a common factor multiplied by the sum of two algebraic expressions."

NAME _____

DATE _____

FIND THE SHARED FACTOR

Find the greatest monomial that divides both terms. Divide each term by that factor, then place the quotients inside parentheses.

WORKED EXAMPLE

Rewrite $11x + 22$ as a common factor multiplied by a sum.

1. Both terms have a common factor of 11.
2. $11x / 11 = x$, and $22 / 11 = 2$.
3. Write the common factor outside the parentheses: $11(x + 2)$.

Answer: $11(x + 2)$

PRACTICE 6 problems

- 1** Rewrite $6x + 18$ as a common factor multiplied by a sum.

ANSWER _____

- 2** Rewrite $9x + 36$ as a common factor multiplied by a sum.

ANSWER _____

- 3** Rewrite $8x^4 + 40x$ as a common factor multiplied by a sum.

ANSWER _____

- 4** Rewrite $12x^4 + 48x$ as a common factor multiplied by a sum.

ANSWER _____

- 5** Rewrite $15x^5 + 60x$ as a common factor multiplied by a sum.

ANSWER _____

- 6** Rewrite $35x^5 + 140x$ as a common factor multiplied by a sum.

ANSWER _____

APPLY IT Show your work

- 1** For a gaming event, a club collects $18x$ dollars in entry fees and 54 dollars from snack sales. Write the total, $18x + 54$, as a common factor multiplied by a sum.

WORK SPACE

ANSWER _____

- 2** A skateboard fundraiser earns $25x$ dollars from custom sticker orders and 75 dollars from donations. Write the total, $25x + 75$, as a common factor multiplied by a sum.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Rewrite $36x^4 + 12x$ by factoring out the greatest common monomial factor. Then explain why your factor is greatest.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Rewrite $6x + 18$ as a common factor multiplied by a sum.	$6(x + 3)$
2	Rewrite $9x + 36$ as a common factor multiplied by a sum.	$9(x + 4)$
3	Rewrite $8x^4 + 40x$ as a common factor multiplied by a sum.	$8x(x^3 + 5)$
4	Rewrite $12x^4 + 48x$ as a common factor multiplied by a sum.	$12x(x^3 + 4)$
5	Rewrite $15x^5 + 60x$ as a common factor multiplied by a sum.	$15x(x^4 + 4)$
6	Rewrite $35x^5 + 140x$ as a common factor multiplied by a sum.	$35x(x^4 + 4)$

PART 2 • APPLY IT

1. $18(x + 3)$ The greatest common monomial factor of $18x$ and 54 is 18 . Divide each term by 18 to get x and 3 .
2. $25(x + 3)$ The greatest common monomial factor of $25x$ and 75 is 25 . Divide each term by 25 to get x and 3 .

CHALLENGE

$12x(3x^3 + 1)$. The factor $12x$ divides both original terms, and no larger monomial divides both.

Accept algebraically equivalent products with the factors in either order. For the challenge, the factor must be $12x$ because the prompt asks for the greatest common monomial factor.