Division as a Fraction

EXAMPLE Circle the expression below that is equivalent to $18+24\div(6-3)$. Then, evaluate the circled expression.

$$\frac{18+24}{6-3} \qquad 18+\frac{24}{6-3} \qquad 18+\frac{24}{6}-3 \qquad \frac{18+24}{6}-3$$

We can rewrite the division in $18+24\div(6-3)$ as a fraction. Since division comes before addition in the order of operations, only 24 is divided by the grouped quantity $(6-3)$. So, we have numerator 24 and denominator $6-3$.

Therefore, $18+24\div(6-3)$ is equivalent to $\mathbf{18+\frac{24}{6-3}}$.

To evaluate, we compute the denominator of the fraction first, then divide, then add:

$$\begin{aligned} 18+\frac{24}{6-3} &= 18+\frac{24}{3} \\ &= 18+8 \\ &= \mathbf{26}. \end{aligned}$$

PRACTICE Connect each expression on the left with its equivalent expression on the right. Then, evaluate the matched expression on the right.

35. $(30-20)\div(5-3)$ $\qquad\qquad$ $30-\frac{20}{5}-3=$ ____________

36. $(30-20)\div5-3$ $\qquad\qquad$ $30-\frac{20}{5-3}=$ ____________

37. $30-20\div(5-3)$ $\qquad\qquad$ $\frac{30-20}{5-3}=$ ____________

38. $30-20\div5-3$ $\qquad\qquad$ $\frac{30-20}{5}-3=$ ____________

Remember, when evaluating expressions, we apply the following **order of operations**:

1. Grouped expressions (numerators, denominators, and expressions inside parentheses or absolute value bars)
2. Exponents
3. Multiplication and division (working from left to right)
4. Addition and subtraction (working from left to right)

PRACTICE | Evaluate each expression below.

39. $\dfrac{6+3}{3}+2=$ __________

40. $5-\dfrac{8}{6(4)}=$ __________

41. $3\cdot\dfrac{7+9}{2}=$ __________

42. $\dfrac{3\cdot7+9}{2}=$ __________

43. $\dfrac{-3(4)}{(6-4)^2}=$ __________

44. $\dfrac{20^2}{2}+\dfrac{20}{2^2}+\left(\dfrac{20}{2}\right)^2=$ __________

45. $17-2\left(\dfrac{1+11}{2\cdot3}\right)=$ __________

46. $\dfrac{6^2}{7+5}\cdot\dfrac{7-6-5}{2}=$ __________

47. $\dfrac{8(7-3)^2}{-(3-7)^3}=$ __________

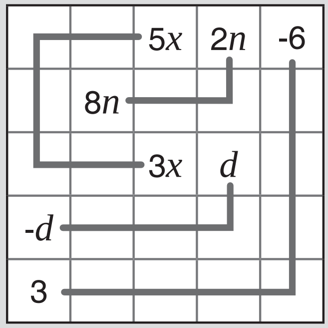
48. $\left(\dfrac{5+7+9}{2^5-5^2}\right)^3=$ __________

A ***term*** is a number, a variable, or a product of numbers and variables. Terms with the same variables are called ***like terms***. For example, $3x$ and $6x$ are like terms, and $-2y$ and y are like terms. However, $5x$ and $5y$ are not like terms.

Numbers without variables, such as 4 and -7, are also like terms.

In a **Like Terms Link** puzzle, each pair of like terms is connected by a path, as shown in the solved example below.

		$5x$	$2n$	-6
	$8n$			
		$3x$	d	
$-d$				
3				



Paths may not travel diagonally, cross another path, or pass *through* a square that contains a term.

PRACTICE | Solve each Like Terms Link puzzle below. We recommend using a pencil.

Print more Like Terms Link puzzles at BeastAcademy.com.

49.

$12a$			
	$5c$	$6b$	$2a$
	b		$6c$

50.

			$7x$
	-8	$4y$	
		$-3x$	
$8y$			4

51.

	$13t$	$-5r$		
	$-4s$			
$-4r$			$2t$	$-5s$

52.

			$11u$	
	11		$2v$	$-2u$
		w		
			2	
		$2w$	$-9v$	

EXAMPLE | Simplify the expression $4a+3a$.

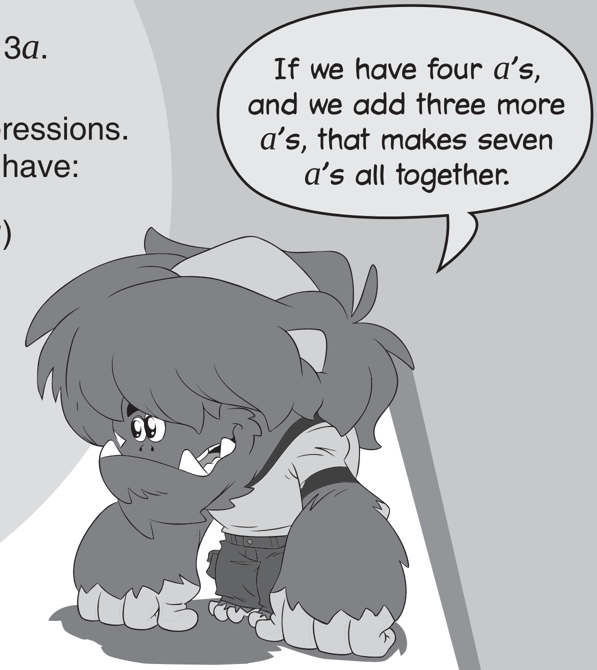
We can combine like terms to simplify expressions. $4a=a+a+a+a$, and $3a=a+a+a$. So, we have:

$$\begin{aligned}4a+3a &= (a+a+a+a)+(a+a+a)\\ &= a+a+a+a+a+a+a\\ &= \mathbf{7a}.\end{aligned}$$

— or —

We factor a from each term. This gives

$$\begin{aligned}4a+3a &= (4+3)a\\ &= \mathbf{7a}.\end{aligned}$$



PRACTICE | Simplify each of the following expressions.

53. $5x+4x=$ ______

54. $10y-3y=$ ______

55. $3d+4d+5d=$ ______

56. $s+3s+15s=$ ______

57. $-3w+12w=$ ______

58. $6p+(-p)=$ ______

59. $8c-14c+3c=$ ______

60. $-22g+36g-12g=$ ______

61. $12n-7n-5n=$ ______

62. $93k+47k-92k=$ ______

63. Write a simplified expression for the perimeter of a square with side length s. **63.** __________

64. Write a simplified expression for the perimeter of a rectangle with width x and height $3x$. **64.** __________