

# Spot the Pieces

Read expressions by their terms, factors, and coefficients.

HIGH SCHOOL • HSA-SSE.A.1a

CCSS.Math.Content.HSA-SSE.A.1a "Interpret parts of an expression, such as terms, factors, and coefficients."

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## EXPRESSION PARTS

Terms are parts of an expression separated by addition or subtraction signs. Factors are quantities multiplied within one term. A coefficient is the numerical factor of a variable term, including its sign.

## WORKED EXAMPLE

In  $7p^2 - 4pq + 9$ , identify the terms, the factors of each variable term, and the coefficients.

1. Split at the addition and subtraction signs:  $7p^2$ ,  $-4pq$ , and  $9$ .
2. In  $7p^2$ , the factors are  $7$ ,  $p$ , and  $p$ , so the coefficient is  $7$ .
3. In  $-4pq$ , the factors are  $-4$ ,  $p$ , and  $q$ , so the coefficient is  $-4$ . The term  $9$  is constant.

**Answer: Terms:  $7p^2$ ,  $-4pq$ ,  $9$ . Factors:  $7$ ,  $p$ ,  $p$  and  $-4$ ,  $p$ ,  $q$ . Coefficients:  $7$  and  $-4$ .**

## PRACTICE 6 problems

- 1** Name the terms in  $3x - 8$ . What is the coefficient of  $x$ ?

ANSWER \_\_\_\_\_

- 2** In  $-5a^3b + 6ab - c$ , list the coefficient of each variable term.

ANSWER \_\_\_\_\_

- 3** For  $10mn^3$ , name the coefficient and the factors.

ANSWER \_\_\_\_\_

- 4** In  $-3r(s + 1) + 5$ , identify the factors and coefficient of the first term.

ANSWER \_\_\_\_\_

- 5** In  $\frac{1}{3}q^3 - 5q + 8$ , identify the coefficients of  $q^3$  and  $q$ , then identify the constant term.

ANSWER \_\_\_\_\_

- 6** List the terms in  $u^3 + uv - v$  and give each term's coefficient.

ANSWER \_\_\_\_\_

## APPLY IT Show your work

- 1** The drama club sells  $t$  tickets for \$15 each and pays a \$60 permit fee. Its profit is  $P = 15t - 60$ . Explain what each term represents and what the coefficient 15 tells you.

WORK SPACE

ANSWER \_\_\_\_\_

- 2** A phone plan charges an \$18 monthly base fee plus \$3 for each extra gigabyte of data. The monthly cost is  $C = 3g + 18$ , where  $g$  is the number of extra gigabytes. Identify the factors of the variable term, the coefficient, and the constant term.

WORK SPACE

ANSWER \_\_\_\_\_

## CHALLENGE One step up

### CHALLENGE

Without expanding, analyze  $5m(m + 3) - 6m$ . Identify the terms, the factors of each term, and the coefficients. Explain why  $m + 3$  is not a separate term of the whole expression.

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## PART 1 • PRACTICE

| # | PROBLEM                                                                                                      | ANSWER                                                                                                                                               |
|---|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Name the terms in $3x - 8$ . What is the coefficient of $x$ ?                                                | <b>Terms: <math>3x</math>, <math>-8</math>. Coefficient of <math>x</math>: <math>3</math>.</b>                                                       |
| 2 | In $-5a^3b + 6ab - c$ , list the coefficient of each variable term.                                          | <b>Coefficients: <math>-5</math> for <math>a^3b</math>, <math>6</math> for <math>ab</math>, and <math>-1</math> for <math>c</math>.</b>              |
| 3 | For $10mn^3$ , name the coefficient and the factors.                                                         | <b>Coefficient: <math>10</math>. Factors: <math>10</math>, <math>m</math>, <math>n^3</math>.</b>                                                     |
| 4 | In $-3r(s + 1) + 5$ , identify the factors and coefficient of the first term.                                | <b>Factors of the first term: <math>-3</math>, <math>r</math>, <math>(s + 1)</math>.<br/>Coefficient: <math>-3</math>.</b>                           |
| 5 | In $\frac{1}{3}q^3 - 5q + 8$ , identify the coefficients of $q^3$ and $q$ , then identify the constant term. | <b>Coefficient of <math>q^3</math>: <math>\frac{1}{3}</math>. Coefficient of <math>q</math>: <math>-5</math>.<br/>Constant term: <math>8</math>.</b> |
| 6 | List the terms in $u^3 + uv - v$ and give each term's coefficient.                                           | <b>Terms: <math>u^3</math>, <math>uv</math>, <math>-v</math>. Coefficients: <math>1</math>, <math>1</math>, <math>-1</math>.</b>                     |

## PART 2 • APPLY IT

- The term  $15t$  is the money collected from ticket sales. The term  $-60$  represents the permit fee, and  $15$  means each ticket brings in \$15.** The variable term multiplies the number of tickets by the price per ticket. The constant is the fixed fee subtracted from revenue.
- The factors of  $3g$  are  $3$  and  $g$ . The coefficient is  $3$ , which means \$3 per extra gigabyte, and the constant term is  $18$ , the monthly base fee.** Read  $3g$  as a product of the per-gigabyte charge and the number of extra gigabytes. The value  $18$  does not depend on  $g$ .

## CHALLENGE

**The terms are  $5m(m + 3)$  and  $-6m$ . The factors are  $5$ ,  $m$ ,  $(m + 3)$  for the first term and  $-6$ ,  $m$  for the second term. The coefficients are  $5$  and  $-6$ . The expression  $m + 3$  is a factor inside the first term, not a separate term of the whole expression, because it is not separated from the first term by an outer addition or subtraction sign.**

Accept equivalent factor lists, such as  $n$ ,  $n$ ,  $n$  instead of  $n^3$ . Accept coefficients of  $1$  and  $-1$  when students write them explicitly, and treat constants as terms rather than variable coefficients.