

ACT Math Foundation Worksheet

8 original questions, working space and separate answer explanations. Version 2026-10-27.

Scope

Enhanced ACT Mathematics foundations.

This is an untimed foundation study sample, not an official examination or complete mock test. Author-reviewed learning materials; independent educator review and learner calibration remain pending.

How to use this worksheet

Work through the questions before opening the answer section. Write your calculation or the reason for your choice. After checking the explanation, return to the linked lesson for any unfamiliar distinction.

<https://openexam.site/exams/act-math/worksheets/>

QUESTION 1 / Numbers, vectors & matrices

What is $\frac{3}{6} - \frac{1}{4}$?

- A. $\frac{1}{4}$
- B. $\frac{3}{4}$
- C. $\frac{1}{3}$
- D. $\frac{2}{5}$

Working / reasoning:

Item act-number-1-1 | Lesson: <https://openexam.site/exams/act-math/learn/number/>

QUESTION 2 / Equations with restrictions

If $5x - 9 = 2x + 15$, what is x ?

- A. $\frac{24}{5}$
- B. 2
- C. 8
- D. 24

Working / reasoning:

Item act-equations-1-2 | Lesson: <https://openexam.site/exams/act-math/learn/equations/>

QUESTION 3 / Functions as input rules

$f(x) = 2x + 5$ for $x < 0$ and $f(x) = x^2 - 5$ for $x \geq 0$. What is $f(-6)$?

- A. 31
- B. -17
- C. -41
- D. -7

Working / reasoning:

Item act-functions-1-3 | Lesson: <https://openexam.site/exams/act-math/learn/functions/>

QUESTION 4 / Coordinate geometry connections

A line has slope $\frac{6}{3}$. What is the slope of a perpendicular line?

- A. -2
- B. $\frac{1}{2}$
- C. 2
- D. $-\frac{1}{2}$

Working / reasoning:

Item act-coordinate-1-4 | Lesson: <https://openexam.site/exams/act-math/learn/coordinate/>

QUESTION 5 / Summaries from data

A class of 3 students has mean score 60; another class of 6 students has mean 90. What is the combined mean?

- A. 75
- B. 70
- C. 80
- D. 50

Working / reasoning:

Item act-statistics-1-1 | Lesson: <https://openexam.site/exams/act-math/learn/statistics/>

QUESTION 6 / Rates, scales & mixtures

A map scale is 1 cm to 4 km. Two towns are 5 cm apart on the map. How many kilometers apart are they?

- A. 2000

B. $\frac{5}{4}$

C. 20

D. 4

Working / reasoning:

Item act-ratios-1-2 | Lesson: <https://openexam.site/exams/act-math/learn/ratios/>

QUESTION 7 / Vectors and matrix structure

Vectors $u=(4,-2)$ and $w=(3,6)$ are given. What is the second component of $2u-w$?

A. -8

B. -10

C. 5

D. -16

Working / reasoning:

Item act-vector-operations-1-2 | Lesson: <https://openexam.site/exams/act-math/learn/vector-operations/>

QUESTION 8 / Systems and practical constraints

The equations $x + y = 19$ and $x - y = 7$ hold. What is y ?

A. 6

B. 7

C. 13

D. 12

Working / reasoning:

Item act-systems-1-4 | Lesson: <https://openexam.site/exams/act-math/learn/systems/>

ACT Math: Answers & Explanations

Compare the method or rule as well as the final answer. These explanations are study aids, not official scoring guidance.

QUESTION 1 / act-number-1-1

Answer: $\frac{1}{4}$

1. Use denominator 12: $\frac{6}{12} - \frac{3}{12}$.
2. Subtract the numerators and reduce the fraction.
3. The requested value is $\frac{1}{4}$.

QUESTION 2 / act-equations-1-2

Answer: 8

1. Subtract $2x$ from both sides and add the constant on the left.
2. Divide by the remaining coefficient.
3. The requested value is 8.

QUESTION 3 / act-functions-1-3

Answer: -7

1. The input is negative, so use the first branch.
2. Substitute the negative input into the linear rule.
3. The requested value is -7.

QUESTION 4 / act-coordinate-1-4

Answer: $-\frac{1}{2}$

1. For two nonvertical perpendicular lines, the slopes multiply to -1 .
2. Take the reciprocal and change its sign.
3. The requested value is $-\frac{1}{2}$.

QUESTION 5 / act-statistics-1-1

Answer: 80

1. Convert each mean into a total by multiplying by its group size.
2. Add the totals and divide by the total number of students.
3. The requested value is 80.

QUESTION 6 / act-ratios-1-2

Answer: 20

1. Each map centimeter represents the stated real distance.
2. Multiply map distance by kilometers per centimeter; centimeters cancel.
3. The requested value is 20.

QUESTION 7 / act-vector-operations-1-2

Answer: -10

1. Compute the second component only: $2(-2)$ minus the second component of w .
2. Apply the scalar before subtracting the vector.
3. Substitute the given numbers: $2 \times (-2) - 6 = -10$.
4. Therefore the requested value is -10.

QUESTION 8 / act-systems-1-4

Answer: 6

1. Subtract the second equation from the first to eliminate x .
2. The resulting equation has $2y$ on the left; divide by 2.
3. The requested value is 6.

References and scope notes

The questions and teaching explanations are original catalog materials. References support the selected concepts; they are not endorsements or a reproduced official examination bank.

ACT Mathematics content

<https://www.act.org/content/act/en/products-and-services/the-act/test-preparation/description-of-math-test.html>

400 parameterized questions across 96 families, not 400 independent designs

Selected foundations, not complete ACT syllabus coverage

Independent educator review pending; no ACT score prediction

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For current exam-provider requirements, follow the official references in the exam guide. This PDF does not assess certification, professional competence or readiness.