

ACT Math Study Pack

Quick Review · Formula Sheet · Focused Practice · Flashcards

12 questions · suggested time: 15 minutes

How to use this pack. Start with the review, complete the practice before reading the key, then cut out or cover the flashcard answers for self-testing. These are original, unofficial practice materials. ACT is a registered trademark of ACT Education Corp.; no endorsement is implied.

Quick Review

Number and Quantity. Keep signs attached to numbers. Convert fractions, decimals, and percents before comparing. Use units in rates and check whether a result is reasonable.

Algebra. Distribute before combining like terms. For equations, do the same operation to both sides. In a system, the solution must satisfy both equations.

Functions. Read $f(x)$ as the output for input x . Slope is change in y divided by change in x ; in $y=mx+b$, m is slope and b is the y -intercept.

Geometry. Sketch and label the figure. Use the right formula, preserve squared/cubed units, and remember that a triangle's angles sum to 180 degrees.

Statistics and Probability. Mean is total divided by count; median is the middle after ordering. For independent events, multiply probabilities; for "A or B" disjoint events, add them.

Math Formula Sheet

Lines: $m = \frac{y_2 - y_1}{x_2 - x_1}$; $y = mx + b$. **Quadratic formula:** $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. **Right triangle:** $a^2 + b^2 = c^2$. **Triangle:** $A = \frac{1}{2}bh$; interior angles sum to 180° . **Rectangle:** $A = lw$; perimeter $P = 2l + 2w$. **Circle:** $A = \pi r^2$; circumference $C = 2\pi r$. **Prism:** $V = Bh$; rectangular prism $V = lwh$. **Percent change:** $\frac{\text{new} - \text{original}}{\text{original}} \times 100\%$. **Mean:** $\frac{\text{sum}}{\text{count}}$. **Probability:** $P(A) = \frac{\text{favorable outcomes}}{\text{total outcomes}}$.

Focused Practice

Choose the correct answer. Show your work beside each item.

1. If $3(2x-5)=21$, what is x ?

- A. 5
C. 7

- B. 6
D. 8

2. A jacket priced at \$80 is discounted by 25%. What is the sale price?

- A. \$20
C. \$60

- B. \$55
D. \$64

- A line passes through (2, 5) and (6, 13). What is its slope?
A. $\frac{1}{2}$
B. 2
C. 4
D. 8
- What is the larger solution of $x^2 - 5x + 6 = 0$?
A. 1
B. 2
C. 3
D. 6
- A right triangle has legs 6 and 8. What is the hypotenuse?
A. 9
B. 10
C. 12
D. 14
- A bag has 5 red and 3 blue counters. What is the probability of drawing blue?
A. $\frac{3}{8}$
B. $\frac{5}{8}$
C. $\frac{3}{5}$
D. $\frac{1}{3}$
- If $f(x) = 2x^2 - 3$, what is $f(-2)$?
A. 1
B. 5
C. 8
D. 11
- A car travels 180 miles in 3 hours at a constant rate. How far will it travel in 5 hours?
A. 240 miles
B. 270 miles
C. 300 miles
D. 360 miles
- The mean of 4, 7, 9, and n is 8. What is n ?
A. 10
B. 11
C. 12
D. 13
- What is the area of a circle with radius 4?
A. 4π
B. 8π
C. 16π
D. 32π
- Solve the system: $x + y = 9$ and $x - y = 3$. What is x ?
A. 3
B. 6
C. 9
D. 12
- A scale drawing uses 1 cm for 4 m. A wall is 7.5 cm long in the drawing. What is its actual length?
A. 11.5 m
B. 24 m
C. 30 m
D. 32 m

Answer Key and Explanations

1. **B.** Divide by 3 to get $2x-5=7$; add 5 and divide by 2, so $x=6$.
2. **C.** The discount is $0.25(80) = \$20$. Subtract it from \$80 to get \$60.
3. **B.** Slope is $(13-5)/(6-2) = 8/4 = 2$.
4. **C.** Factor: $(x-2)(x-3)=0$. The solutions are 2 and 3, so the larger is 3.
5. **B.** By the Pythagorean theorem, $c = \sqrt{6^2 + 8^2} = \sqrt{100} = 10$.
6. **A.** There are 3 blue counters among 8 total, so the probability is $3/8$.
7. **B.** Substitute -2: $2(-2)^2 - 3 = 8 - 3 = 5$.
8. **C.** The rate is $180/3 = 60$ miles per hour; in 5 hours the distance is $60(5) = 300$ miles.
9. **C.** A mean of 8 across 4 values means a total of 32. The known values total 20, so $n=12$.
10. **C.** Area is $\pi r^2 = \pi(4^2) = 16\pi$.
11. **B.** Add the equations: $2x=12$, so $x=6$.
12. **C.** Multiply the drawing length by the scale: $7.5 \times 4 = 30$ m.

Flashcards

Cover the right column, answer aloud, and then check. For print-and-cut use, trim along the rules.

Front / term	Back / meaning
Slope	Rate of change: $(y_2 - y_1)/(x_2 - x_1)$.
Pythagorean theorem	For a right triangle, $a^2 + b^2 = c^2$.
Circle area	$A = \pi r^2$.
Circle circumference	$C = 2\pi r$ or πd .
Triangle area	$A = \frac{1}{2}bh$.
Rectangle area	$A = lw$.
Rectangular prism volume	$V = lwh$.
Mean	Sum of values $\div$ number of values.
Median	Middle value after sorting; average the two middle values if needed.
Percent change	$(\text{New} - \text{Original}) / \text{Original} \times 100\%$.
Simple interest	$I = Prt$, with rate and time in matching units.
Distance formula	Distance = rate $\times$ time.
Function notation	$f(a)$ means substitute a for every x .
Distributive property	$a(b+c) = ab+ac$.
Quadratic formula	For $ax^2 + bx + c = 0$: $x = [-b \pm \sqrt{b^2 - 4ac}] / (2a)$.
Complement probability	$P(\text{not } A) = 1 - P(A)$.