# 6 ILLINOIS IAR

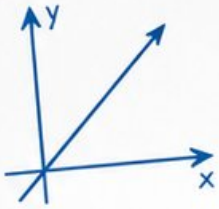
GRADE 7 MATH

# PRACTICE TESTS

Standards Aligned **Problem Solving** For Comprehensive Assessment Programs

$y = mx + b$

$2(x - 3) = 4x + 6$




**6 PRINTED TESTS**

**2 ONLINE TESTS**




USE THESE TWO **ADDITIONAL ONLINE PRACTICE TESTS** FOR EXTRA REVIEW AFTER THE PRINTED TESTS IN THIS BOOK.

Build Confidence

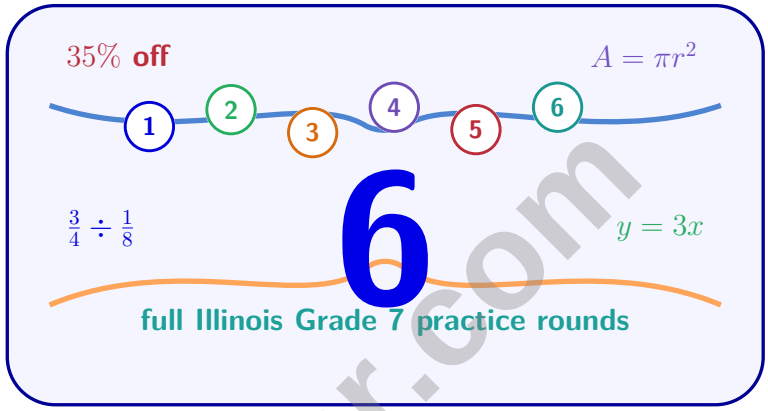
Strengthen Math Skills

Detailed Answers & Explanations

Improve Test Performance

# 6 Illinois IAR Grade 7 Math Practice Tests

*IAR-Aligned Review with Practice, Keys, and Explanations*






**Six complete 40-question Grade 7 IAR practice rounds with proportional relationships, percents, rational numbers, expressions, equations, geometry, statistics, probability, answer keys, and clear explanations for every item.**

**Jay Daie and Reza Nazari**

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# Welcome, Illinois Grade 7 Problem Solver!

Six focused rounds for sharper IAR math thinking

This book gives you six full Grade 7 IAR math practice tests. Each round is built to help you notice structure, compare quantities, use proportional reasoning, handle rational numbers, and explain your thinking with care.

**Your Illinois Practice Promise**

I will read every question carefully, choose a strategy that fits, write enough work to prove my answer, and use corrections as training for the next test.

# How to Use This Book

A six-session plan for confident Grade 7 review

1. **Warm up with the review pages.** Notice the big ideas before starting the tests.
2. **Complete one test at a time.** Treat each 40-question round like a real practice session.
3. **Show your reasoning.** Jot a proportion, equation, diagram, number line, or quick estimate when it helps.
4. **Correct actively.** Rework missed items before reading the explanation.
5. **Choose the next target.** After each test, name one skill and one habit to improve.

**Illinois review rhythm:** Work a test, score it, study your misses, then come back ready for the next round with one clear goal.

# What Is Inside?

Six IAR tests, 240 questions, and a complete review path

| Part | What You Will Practice |
|---|---|
| Tests 1–3 | Proportional relationships, unit rates, percents, rational-number operations, and careful reading. |
| Tests 4–6 | Expressions, equations, inequalities, scale drawings, geometry, and multi-step problem solving. |
| Answer Pages | Compact keys and explanations that show why each answer works. |

The tests are mixed on purpose. Grade 7 success means recognizing which idea is being tested even when the next question changes format.

# Table of Contents

1)

| | |
|---|---|
| Savings for Emergency Fund | $3,600 |
| Savings for Vacation | $1,200 |

A savings account is divided into two goals: emergency fund ($3 600) and vacation savings ($1 200). What percentage of the total savings is allocated to the vacation fund?

☐ A. 20%
☐ B. 33%
☐ C. 30%
☐ D. 25%

2) Solve for $x$: $5(x - 4) = 45$

☐ A. $x = 5$
☐ B. $x = 9$
☐ C. $x = 13$
☐ D. $x = 17$

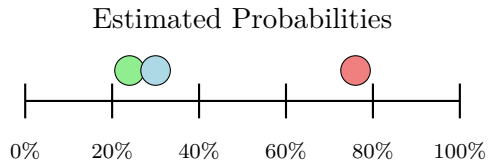
3) A landscaper charges based on square feet of area trimmed. The table shows the cost for different jobs.

| Square Feet | Cost ($) |
|---|---|
| 100 | 25 |
| 250 | 62.50 |
| 400 | 100 |

What is the cost per square foot?

☐ A. $0.30 per sq ft
☐ B. $0.40 per sq ft
☐ C. $0.20 per sq ft
☐ D. $0.25 per sq ft

4)




Three simulation estimates are plotted on the number line: 0.24 (green), 0.38 (blue), and 0.76 (red). If the true theoretical probability is 0.25, which estimate has the smallest error?

☐ A. Green at 0.24
☐ B. Blue at 0.38
☐ C. Red at 0.76
☐ D. All three have equal error

5) A librarian wants to know how many books each student checks out per month. She decides to survey students who are currently in the library. What type of bias does this create?

☐ A. Systematic bias
☐ B. Convenience bias
☐ C. Measurement bias
☐ D. Voluntary response bias

6) A fair die is rolled. What is the probability of rolling an even number?

☐ A. $\frac{1}{6}$
☐ B. $\frac{2}{6}$
☐ C. $\frac{1}{2}$
☐ D. $\frac{2}{3}$

7) Two sales reps' weekly commission earnings (in dollars):

| Rep | Mean | Median |
|---|---|---|
| Rep A | $1200 | $1400 |
| Rep B | $1200 | $1000 |

Which statement best describes their earnings?

☐ A. Both reps earn identical amounts weekly
☐ B. Rep A has low-earning weeks pulling the mean down; Rep B has high-earning weeks
☐ C. Rep A's median exceeds the mean (low outliers); Rep B's mean exceeds median (high outliers)
☐ D. Rep B earns more on average

8) A line plot shows the number of hours a student practices violin each week over 10 weeks: 1, 2, 2, 2, 3, 3, 3, 3, 4, 5. Which measure best describes the typical practice time?

☐ A. The mean (average)
☐ B. The mode
☐ C. The median
☐ D. The range

9) A model train set has a scale of 1 : 87. If the model is 12 cm long, how many centimeters long is the actual train (to the nearest whole number)?

1) A rectangular prism with dimensions 2 cm × 3 cm × 8 cm is cut diagonally through opposite vertices. The maximum number of faces that can be intersected by such a plane is:

☐ A. 3
☐ B. 4
☐ C. 5
☐ D. 6

2) A point is moved from $(-3, 1)$ to $(4, 6)$ by a single transformation. Which of the following best describes this transformation?

☐ A. Translation by $(7, 5)$
☐ B. Reflection over the origin
☐ C. Rotation of 90°
☐ D. Reflection over the $x$-axis

3) If the probability of rolling a 3 on a die is $\frac{1}{6}$, what is the probability of NOT rolling a 3?

4) The population of a town was 5 000 and increased to 6 500. What is the percent increase?

☐ A. 15%
☐ B. 25%
☐ C. 30%
☐ D. 35%

5) A simulation estimates the probability of an event to be 0.40 based on 250 trials. In another simulation with the same event and 1000 trials, the estimated probability is 0.38. Which statement is true?

☐ A. The first simulation is more accurate
☐ B. The second simulation is more reliable because it uses more trials
☐ C. Both simulations must have made errors
☐ D. The true probability is exactly 0.39

6) If the probability of rain on Monday is $\frac{1}{4}$ and the probability of rain on Tuesday is $\frac{1}{3}$, and these events are independent, what is the probability of NO rain on both days?

☐ A. $\frac{1}{6}$
☐ C. $\frac{1}{7}$
☐ B. $\frac{1}{12}$
☐ D. $\frac{1}{2}$

7) **Two Estimates: Which is Better?**

Estimate X: 55 vs. Actual 60 Estimate Y: 62 vs. Actual 60

☐ A. Estimate X is better
☐ C. Both equally good
☐ B. Cannot compare
☐ D. Estimate Y is better

8) Expand: $(3x + 2) \cdot 5$

☐ A. $3x + 10$
☐ C. $15x + 2$
☐ B. $15x + 10$
☐ D. $8x + 5$

9) A scientist records two temperature readings: $-8°C$ and $12°C$. What is the difference between these temperatures (how many degrees apart)?

☐ A. $4°C$
☐ C. $20°C$
☐ B. $-20°C$
☐ D. $-4°C$

10) A fair six-sided die is rolled 60 times. Based on the theoretical probability, how many times would you expect to roll a 5?

1) Which likelihood term describes a probability of 0.1?

☐ A. Certain
☐ B. Likely
☐ C. Unlikely
☐ D. Even chance

2) A photograph is scaled down by a factor of $\frac{1}{4}$. If the original photograph is 8 inches wide, what is the width of the scaled version?

☐ A. 1 inch
☐ B. 2 inches
☐ C. 4 inches
☐ D. 6 inches

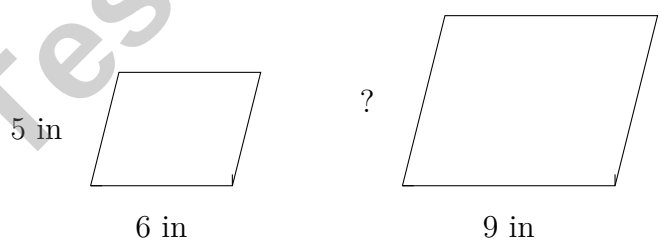
3) A rectangular warehouse is shown on two different blueprints. Blueprint 1 uses scale 1 cm : 4 m and shows the warehouse as 5 cm by 7.5 cm. If Blueprint 2 shows it as 2.5 cm by 3.75 cm, what is the scale of Blueprint 2?

☐ A. 1 cm : 2 m
☐ B. 1 cm : 4 m
☐ C. 1 cm : 6 m
☐ D. 1 cm : 8 m

4) An angle is 8° more than its complement. What is the measure of the smaller angle?

☐ A. 49°
☐ B. 41°
☐ C. 56°
☐ D. 82°

5)




Two similar parallelograms are shown. If the scale factor is 1.5, what is the height of the larger parallelogram?

☐ A. 6.5 in
☐ B. 7.5 in
☐ C. 8 in
☐ D. 8.5 in

6) A circular garden has a diameter of 20 feet. About how many square feet is the garden? Use $\pi \approx 3.14$.

☐ A. 62.8 $ft^2$
☐ B. 125.6 $ft^2$
☐ C. 314 $ft^2$
☐ D. 1256 $ft^2$

7) A clothing store sells shirts in 3 fits (Slim, Regular, Loose) and 5 sizes (XS, S, M, L, XL). If a customer randomly picks one fit and one size, what is the probability of selecting Regular and Large?

☐ A. $\frac{1}{5}$
☐ B. $\frac{1}{15}$
☐ C. $\frac{1}{8}$
☐ D. $\frac{2}{15}$

8) A histogram shows heights (in inches) of students in two grades. Grade 6's histogram peaks at 60–62 inches (range 55–68 inches). Grade 7's histogram peaks at 63–65 inches (range 58–70 inches). Based on this comparison, which statement is TRUE?

☐ A. Grade 7's typical height is greater, and distributions overlap from 58–68 inches
☐ B. Every Grade 7 student is taller than Grade 6
☐ C. Grade 6 is always shorter
☐ D. Grade 6 has more height variation

9) A data set from a random sampling of 300 high school students shows:

| Transport Mode | Count |
|---|---|
| Bus | 120 |
| Car | 145 |
| Walk/Bike | 35 |

Based on this experimental data, if a school has 2400 students, how many are expected to use a car?

☐ A. 145
☐ B. 380
☐ C. 960
☐ D. 1160

# Illinois IAR Grade 7 Practice Test Answer Keys

**How to use this section with a Grade 7 student:**

1. check the answer first and circle any item that needs another look
2. retry the problem with fresh work before reading the explanation
3. write one short lesson learned from each missed or guessed item

**A strong review routine turns every correction into a sharper plan for the next Illinois IAR practice test.**

# Practice Test Answers and Explanations

## Practice Test 1 Answers and Explanations

1) **Choice D is correct.** 7.RP.3 Total: $\$3\,600 + \$1\,200 = \$4\,800$. Vacation percent: $\frac{1200}{4800} = 0.25 = 25\%$.
2) **Choice C is correct.** 7.EE.4a Distribute: $5x - 20 = 45$. Add 20: $5x = 65$. Divide by 5: $x = 13$.
3) **Choice D is correct.** 7.RP.1-7.RP.3 $k = 25/100 = 0.25$ dollars per square foot. Verify: $62.50/250 = 0.25$ and $100/400 = 0.25$.
4) **Choice A is correct.** 7.SP.5-7.SP.8 Error for green: $|0.24 - 0.25| = 0.01$. Error for blue: $|0.38 - 0.25| = 0.13$. Error for red: $|0.76 - 0.25| = 0.51$. Green has the smallest error.
5) **Choice B is correct.** 7.SP.1-7.SP.4 Surveying only students already in the library is convenient but misses students who rarely visit, creating a non-representative sample.
6) **Choice C is correct.** 7.SP.5-7.SP.8 Even numbers: $2, 4, 6$ (3 outcomes). $P(\text{even}) = \frac{3}{6} = \frac{1}{2}$.
7) **Choice C is correct.** 7.SP.1-7.SP.4 Mean < Median indicates low outliers pulling the mean down. Mean > Median indicates high outliers pulling the mean up. Rep A: 1200 < 1400 (low outliers). Rep B: 1200 > 1000 (high outliers).
8) **Choice B is correct.** 7.SP.1-7.SP.4 The mode is 3 hours (appears 4 times), which best represents the typical week's practice. The mode is most useful for identifying the most common value.
9) **The correct answer is** 1044 **.** 7.G.1-7.G.5 Actual length $= 12 \times 87 = 1044$ cm. This is approximately 10.44 meters.
10) **Choice B is correct.** 7.SP.5-7.SP.8 Sizes: 2; colors: 4. Correct total: $2 \times 4 = 8$. The customer forgot to count one size, dividing by 2 instead.
11) **Choice C is correct.** 7.SP.5-7.SP.8 $P(3) \cdot P(5) = \frac{1}{6} \cdot \frac{1}{6} = \frac{1}{36}$ for independent events.
12) **Choice B is correct.** 7.SP.6 Experimental probability $= \frac{58}{360} \approx 0.161$. Note that the theoretical probability of rolling a sum of 7 is $\frac{6}{36} = \frac{1}{6} \approx 0.167$, which is very close to the experimental result.
13) **Choice B is correct.** 7.SP.1-7.SP.4 With 7 values, the median is at position $\frac{7+1}{2} = 4$. The 4th value is 24.
14) **The correct answer is** 125.6 **.** 7.G.4-7.G.6 Circumference $= 2\pi r = 2 \times 3.14 \times 5 = 31.4$ m. Distance $= 4 \times 31.4 = 125.6$ m.
15) **Choice B is correct.** 7.SP.5-7.SP.8 $P(\text{not like}) = 1 - \frac{7}{8} = \frac{1}{8}$. Expected: $\frac{1}{8} \times 80 = 10$.
16) **Choice A is correct.** 7.RP.3 P: $\frac{|84-100|}{100} \times 100\% = 16\%$. Q: $\frac{|28-32|}{32} \times 100\% = 12.5\%$. R: $\frac{|66-75|}{75} \times 100\% = 12\%$. S: $\frac{|54-60|}{60} \times 100\% = 10\%$. Attempt P has the largest error.
17) **Choice A is correct.** 7.EE.1-7.EE.2 Area $= 4(2w + 3) = 8w + 12$. The model shows $4 \times 2w = 8w$ and $4 \times 3 = 12$.
18) **The correct answer is A,B.** 7.G.1-7.G.5 Correct answers: (A) $(1, 0) \to (1 + 2, 0 + 3) = (3, 3) \to (-3, 3)$. (B) $(0, 0) \to (2, 3) \to (-2, 3)$. Both steps verified. Distractors: (C) True but not a unique property of this transformation (all rigid transformations preserve congruence). (D) False—rigid transformations do not change size.
19) **Choice A is correct.** 7.NS.1-7.NS.3 $5 - 9 = 5 + (-9) = -4$.
20) **Choice D is correct.** 7.RP.1-7.RP.3 The scale $\frac{1}{4}$ inch : 1 foot means 1 inch : 4 feet. So $1.5 \times 4 = 6$ feet.
21) **Choice D is correct.** 7.RP.3 Interest earned: $2400 - 2000 = \$400$. $400 = 2000 \times r \times 4 \Rightarrow 400 = 8000r \Rightarrow r = 0.05 = 5\%$.
22) **Choice D is correct.** 7.NS.1b Model as $50 + (-12) + 8 = 50 - 12 + 8 = 46$. The stock fell \$12 then rose \$8 for a net change of $-\$4$.
23) **Choice C is correct.** 7.SP.1-7.SP.4 31% of $400 = 0.31 \times 400 = 124$ pies.
24) **Choice D is correct.** 7.RP.3 25% is $\frac{1}{4}$ of the total. $\frac{1}{4} \times 120 = 30$.
25) **Choice C is correct.** 7.RP.3 If original is \$90 and sale price is \$72, then discount $= (90-72)/90 = 18/90 = 0.20 = 20\%$.
26) **Choice C is correct.** 7.EE.1-7.EE.2 Substitute: $\frac{7-1}{3} + 2 = \frac{6}{3} + 2 = 2 + 2 = 4$.
27) **Choice B is correct.** 7.EE.1 Combine: $(-4 + 6 - 5)m = -3m$.
28) **Choice A is correct.** 7.EE.1-7.EE.2 The rectangle has width $2x + 3$. For area $6x + 9$, height must be 3. This is the GCF.
29) **Choice B is correct.** 7.RP.1-7.RP.3 Must pass through origin $(0, 0)$. Only option B qualifies. Slope is $\frac{9}{3} = 3$, so $y = 3x$.

## Author's Note

**A Page for Persistence**

## Hi, Persistent Problem Solver!

◇ Some Grade 7 questions ask you to hold several ideas in your mind at once. That can feel hard, and that is exactly why practice matters. ◇

⋆ **Remember this:** You showed persistence by continuing through the set. That habit is powerful because difficult problems often open after one more good attempt. You practiced across 6 full Grade 7 practice tests, and that repeated effort matters. ⋆

**Persistence Tools**

- **Try a Smaller Case:** Use an easier number to see the pattern.
- **Draw It:** Make the situation visible.
- **Restate It:** Say the question in your own words.
- **Check One Step:** Fix the first unclear place.

**Grade 7 test-day tip:** When stuck, do not restart everything. Find the first step you trust, then rebuild from there.

If you want to share something or ask a question, please email me at jay@testinar.com.

**Jay Daie**

Your Persistence Coach

# PRACTICE TODAY. SUCCEED TOMORROW!

This book includes 6 full-length Math practice tests and 2 online tests to help Grade 7 students build confidence, strengthen skills, and excel on standardized assessments.

Each practice test is carefully crafted to reflect the latest standards and includes a variety of question types, realistic test conditions, and detailed answer explanations.

Perfect for classroom use, homework, test preparation, and extra practice at home.

## THIS BOOK INCLUDES:

- 6 Full-Length Printed Tests
- 2 Online Practice Tests
- Detailed Answers & Explanations

## MORE PRACTICE. GREATER RESULTS.

Give your child the tools to build strong math skills, confidence, and a positive attitude toward learning.

## WHAT YOU'LL GAIN

**Build Confidence**
Practice regularly to feel prepared and test-ready.

**Strengthen Math Skills**
Develop key math concepts and problem solving abilities.

**Improve Understanding**
Learn with clear explanations and step-by-step solutions.

**Test Confidence**
Familiarize with test formats and improve accuracy and speed.

**Boost Performance**
Apply your knowledge and achieve your best score!

## TOPICS COVERED

- Ratios & Proportions
- The Number System
- Expressions & Equations
- Geometry
- Percents & Decimals
- Statistics & Probability
- Data Analysis
- Measurement & Conversions
- Algebraic Thinking
- And More!

## 2 ONLINE TESTS

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