HMH Guide to
Success in Math
for the **ACT**

A one-page practice test for each skill in these six domains:

- Number and Quantity (30 skills)
- Algebra (34 skills)
- Functions (26 skills)
- Algebra and Functions (21 skills)
- Geometry (40 skills)
- Statistics and Probability (29 skills)

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HMH Guide to
Success in Math
for the **ACT**®

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HMH Guide to Success in Math for the ACT®

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CONTENTS

Contents

The math section of the ACT® test assesses a variety of skills that are organized into six categories: Number and Quantity, Algebra, Functions, Algebra and Functions, Geometry, and Probability and Statistics. The purpose of this publication is to provide practice on these skills using the question types on the ACT® test. For each skill, there is a one-page practice test that includes a sample question with its worked-out solution as well as practice questions. Your students should record their answers on a copy of the generic answer sheet, which appears following the last practice test.

The skills listed in the Table of Contents below and on the practice tests are paraphrases of the wording of the skills identified in the ACT, Inc. publication *ACT College & Career Readiness Standards – Mathematics*.

Number and Quantity (N)

Algebra (A)

Functions (F)

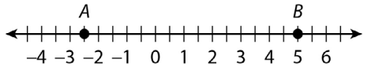
Algebra and Functions (AF)

Geometry (G)

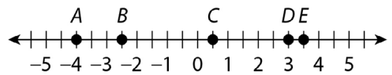
Statistics and Probability (S)

Name _____ Date _____ Class_____

Calculate the distance between two points on a number line. (N 403)

SAMPLE QUESTION	
What is the distance between point *A* and point *B* on the number line below?  **A.** 2.5 **B.** 5 **C.** 7.5 **D.** 9 **E.** 10.5	Point *A* is located at -2.5, which is 2.5 units to the left of 0 on the number line. Point *B* is located at 5, which is 5 units to the right of 0 on the number line. The distance between the two points can be found by adding these distances. $2.5+5=7.5$ So, the distance between the points is 7.5 units. **Time-Saving Tip:** Start at point *A* and count the number of units traversed to reach point *B*. The correct answer is C. (A) (B) ● (D) (E)

Use the following information to answer Questions 1–3.



1. What is the distance from *A* to *C*?
- **A.** −3.5
- **B.** 3.5
- **C.** 4.5
- **D.** 6.5
- **E.** 7

2. What is the distance from *C* to *D*?
- **F.** 2
- **G.** 2.5
- **H.** 3
- **J.** 3.5
- **K.** 4

3. What is the distance from *B* to *E*?
- **A.** 3.5
- **B.** 4
- **C.** 5.5
- **D.** 6
- **E.** 12

4. Let sea level be defined as 0 meters. The bottom of a ship is located underwater at −9 meters and the highest point of the ship is 46 meters above sea level. What is the total height, in meters, of the ship?
- **F.** 9
- **G.** 37
- **H.** 46
- **J.** 55
- **K.** 64

5. Let ground level be defined as 0 feet. A fence made of posts and panels is installed around a park. The top of each fence post is 4 feet above ground. In order to properly anchor the fence, the posts are set into the ground so the bottom of each post is at a depth of −1.7 feet. What is the total length, in feet, of a fence post?
- **A.** 2.3
- **B.** 3.5
- **C.** 4
- **D.** 5.7
- **E.** 7.4

Name _____ Date _____ Class_____

Identify rational and irrational numbers. (N 604)

SAMPLE QUESTION	
Which of the following is an irrational number? **A.** $\frac{3}{4}$ **B.** 1.35 **C.** $\sqrt{12}$ **D.** $\sqrt{16}$ **E.** $8\frac{1}{2}$	An irrational number is a real number that cannot be expressed as the ratio of two integers. In decimal form, an irrational number neither terminates nor repeats. Choice A is a rational number. Choice B can be rewritten as $\frac{135}{100}=\frac{27}{20}$, which is rational. Choice D can be simplified to $\sqrt{16}=4=\frac{4}{1}$, which is rational. Choice E can be rewritten as $8\frac{1}{2}=\frac{17}{2}$, which is rational. By elimination, choice C must be the correct response. A calculator can be used to verify that $\sqrt{12}$ is irrational. The decimal expansion of $\sqrt{12}$ does not terminate or repeat. **Time-Saving Tip:** The square root of a number is irrational unless the radicand is a perfect square. The correct answer is C. (A) (B) ● (D) (E)

1. Which of the following expressions simplifies to an irrational number?
- **A.** $\sqrt{2}\left(\sqrt{3}-1\right)$
- **B.** $\frac{\sqrt{27}}{\sqrt{3}}$
- **C.** $\left(\sqrt{3}-2\right)^2+\sqrt{48}$
- **D.** $\left(\sqrt{75}+5\right)\left(\sqrt{3}-1\right)$
- **E.** $\frac{3\cdot 5^2}{\sqrt{16}}$

2. What type of number is 4π?
- **F.** Complex number
- **G.** Integer
- **H.** Irrational number
- **J.** Rational number
- **K.** Whole number

3. Which of the following expressions is NOT a rational number?
- **A.** $3(2\pi-1)-6\pi$
- **B.** $\frac{2}{7}$
- **C.** $\sqrt{\frac{25}{4}}$
- **D.** $\sqrt{20.25}$
- **E.** $3^2+4\sqrt{5}$

4. Which of these is a rational number?
- **F.** $\sqrt{\frac{9}{2}}$
- **G.** $\frac{12\pi}{-4\pi}$
- **H.** $\sqrt{7}$
- **J.** π
- **K.** $\sqrt{-16}$

ANSWER KEY

N 201
1. D
2. J
3. E
4. H
5. C
6. K

N 202
1. B
2. K
3. C
4. J

N 203
1. D
2. G
3. B
4. H
5. C

N 301
1. E
2. G
3. E
4. F
5. B
6. K
7. D

N 302
1. C
2. J
3. B
4. F
5. A
6. G

N 303
1. D
2. H
3. A
4. H
5. D

N 401
1. B
2. K
3. C
4. J
5. D
6. G

N 402
1. D
2. F
3. B
4. H
5. E
6. K

N 403
1. C
2. G
3. D
4. J
5. D

N 404
1. D
2. K
3. B
4. J

N 405
1. C
2. J
3. D
4. F
5. C

N 406
1. C
2. F
3. E
4. F
5. B

N 501
1. E
2. H
3. B
4. J

N 502
1. C
2. F
3. D
4. K
5. D
6. J

N 503
1. B
2. F
3. C
4. J

ANSWER KEY

N 504
1. C
2. H
3. D
4. K
5. D
6. G

N 505
1. A
2. G
3. E
4. J

N 601
1. B
2. G
3. C
4. G
5. D
6. H

N 602
1. D
2. K
3. E
4. G

N 603
1. C
2. H
3. B
4. J

N 604
1. A
2. H
3. E
4. G

N 605
1. C
2. G
3. D
4. K

N 606
1. E
2. H
3. D
4. G
5. A
6. J

N 607
1. D
2. F
3. E
4. J

N 701
1. B
2. J
3. C
4. J
5. E
6. G

N 702
1. E
2. G
3. C
4. G

N 703
1. E
2. J
3. A
4. G
5. D
6. J

N 704
1. C
2. K
3. E
4. H

N 705
1. E
2. K
3. D
4. F

N 706
1. B
2. H
3. E
4. J

Name _____ Date _____ Class_____

Enter the ACT® code for the practice test here: _____ (*example:* N 201)

ANSWER SHEET

1. (A) (B) (C) (D) (E)
2. (F) (G) (H) (J) (K)
3. (A) (B) (C) (D) (E)
4. (F) (G) (H) (J) (K)
5. (A) (B) (C) (D) (E)
6. (F) (G) (H) (J) (K)
7. (A) (B) (C) (D) (E)
8. (F) (G) (H) (J) (K)