# Iowa ISASP Grade 8 Math Quizzes

*Quick Topic Assessments with Answer Key*

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QUICK QUIZZES FOR EVERY TOPIC

# Grade 8 Math Quizzes

Topic Quizzes • Chapter Reviews • Answer Key

*Quick, focused quizzes are one of the best ways to find out what you really know — and what you still need to work on.*

*This book has a short quiz for every Grade 8 math topic. Each one takes about 10–15 minutes and covers the most important skills for that section. Take a quiz, score it, and see exactly where you stand.*

*Use it after studying a topic, the night before a test, or anytime you want a fast check-in on your math skills.*

**Take the Quiz**

10–15 minutes per quiz

**Score It**

Check every answer in the key

**Review & Retry**

Study what you missed then quiz again

CHAPTER

# 1

# Irrational Numbers

## What's Inside

CHAPTER 1

# Quiz 1

## Rational and Irrational Numbers

**Name:** _____ **Date:** _____ **Score:** _____ / 8

**1** *Which of the following numbers is **irrational**?*

*A.* $0.75$ *B.* $\sqrt{5}$

*C.* $-3$ *D.* $0.\overline{3}$

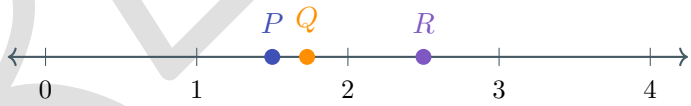
**2** *Circle **all** the irrational numbers from the cards below.*

| $\sqrt{16}$ | $\pi$ | $0.\overline{45}$ | $\sqrt{11}$ | $-7$ |
|---|---|---|---|---|

**3** *True or False: Every number with a **non-terminating** decimal is irrational.*

◯ **True** ◯ **False**

**4** *Three points are plotted on the number line below. Their exact values are $\frac{3}{2}$, $\sqrt{3}$, and $\frac{5}{2}$. Which point represents the **irrational** number?*




◯ $P$ ◯ $Q$

◯ $R$ ◯ *All are rational*

**5** *Simplify:* $\sqrt{81} =$ _____. *Is* $\sqrt{81}$ *rational or irrational?* _____

**6** *Compare* $\sqrt{2}$ *and* $1.5$. *Circle* $>$, $<$, *or* $=$.

$\sqrt{2}$ ◯ $1.5$

## Bonus Challenge

*This is a bonus question for extra credit. Give it your best attempt.*

**7** *A student claims: "$\sqrt{n}$ is **always** irrational." Find **three** values of $n$ (where $1 \leq n \leq 20$) that prove the student wrong. Explain why each one is rational.*

Show your work

### Score Summary

*I got _____ out of _____ correct.*

CHAPTER

# 2

# Lines and Linear Equations

## What's Inside

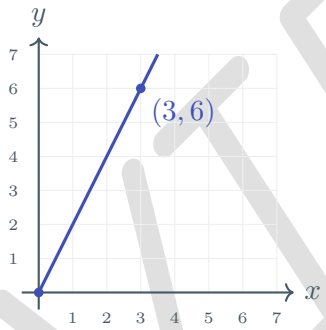
CHAPTER 3

# Quiz 2

## Graphing Proportional Relationships

**Name:** _____ **Date:** _____ **Score:** _____ / 8

**1** *The graph shows a proportional relationship. What is the* ***constant of proportionality*** *$(k)$?*




A. $3$

B. $2$

C. $6$

D. $\frac{1}{2}$

**2** *Complete the table for a proportional relationship.*

| *Time (h)* | 1 | 3 | 5 |
|---|---|---|---|
| *Distance (mi)* | 8 | _____ | _____ |

**3** *True or False: The equation $y = 5x + 2$ represents a* ***proportional relationship****.*

◯ ***True*** ◯ ***False***

**4** *Compare the* ***unit rates*** *(gallons per minute). Circle $>$, $<$, or $=$.*

**Pipe A:** $36$ **gal in** $4$ **min** **Pipe B:** $50$ **gal in** $5$ **min**

**5** *A proportional relationship passes through* $(5, 20)$*. Write the equation in the form* $y = kx$*.*

*Equation:* _____

**6** *A car uses gas at a constant rate:* $2$ *gallons for every* $50$ *miles. How many gallons does it need for* $175$ *miles?*

*Gallons:* _____

## Bonus Challenge

*This is a bonus question for extra credit. Give it your best attempt.*

**7** *Store A sells fruit for* $y = 3x$ *(dollars per pound). Store B's prices:* $2$ *lb costs* $\$5$*,* $4$ *lb costs* $\$10$*. Which store is cheaper, and how much would* $10$ *pounds cost there? Show your work.*

Show your work

**Score Summary**

*I got* _____ *out of* _____ *correct.*

# Answer Key & Explanations

# Answer Key

*First try each quiz on your own, then check your work here.*

## Chapter 1

### Quiz 1: Rational and Irrational Numbers

1. B ($\sqrt{5}$)
2. $\pi$ and $\sqrt{11}$
3. False
4. $Q$
5. 9; Rational
6. $<$
7. $n = 1, 4, 9,$ or $16$ (any three)

### Explanations

1. $0.75 = \frac{3}{4}$ (terminates — rational). $\sqrt{5} \approx 2.2360\ldots$ (non-repeating, non-terminating — irrational). $-3 = \frac{-3}{1}$ (integer — rational). $0.\overline{3} = \frac{1}{3}$ (repeats — rational). Common mistake: thinking $-3$ is irrational because it is negative. Negative numbers can absolutely be rational! ✓

2. $\sqrt{16} = 4$ (perfect square — rational). $\pi \approx 3.14159\ldots$ (never terminates or repeats — irrational). $0.\overline{45}$ repeats, so it equals $\frac{5}{11}$ (rational). $\sqrt{11} \approx 3.316\ldots$ ($11$ is not a perfect square — irrational). $-7 = \frac{-7}{1}$ (integer — rational). Common mistake: forgetting that $\sqrt{16}$ simplifies to a whole number. ✓

3. A non-terminating decimal can still **repeat**, which makes it rational. For example, $0.333\ldots = 0.\overline{3} = \frac{1}{3}$ never terminates, but it repeats, so it is rational. Only decimals that are non-terminating **and** non-repeating are irrational. ✓

4 $P$ is at $\frac{3}{2} = 1.5$ (rational — it is a fraction of integers). $Q$ is at $\sqrt{3} \approx 1.732$ (irrational — 3 is not a perfect square). $R$ is at $\frac{5}{2} = 2.5$ (rational). Only $Q$ is irrational. On the number line, $Q$ sits between 1 and 2, slightly past 1.7. ✓

5 $\sqrt{81} = 9$ because $9 \times 9 = 81$. Since 9 is an integer, it can be written as $\frac{9}{1}$, making it rational. Common mistake: assuming **all** square roots are irrational. Only square roots of non-perfect squares (like $\sqrt{2}$, $\sqrt{11}$) are irrational. ✓

6 $\sqrt{2} \approx 1.414$. Since $1.414 < 1.5$, we have $\sqrt{2} < 1.5$. Verify: $1.5^2 = 2.25 > 2$, so $1.5 > \sqrt{2}$. $1.4^2 = 1.96 < 2$, so $1.4 < \sqrt{2}$. This confirms $\sqrt{2}$ is between 1.4 and 1.5, and therefore less than 1.5. ✓

7 The perfect squares between 1 and 20 are $1, 4, 9$, and 16. $\sqrt{1} = 1$, $\sqrt{4} = 2$, $\sqrt{9} = 3$, $\sqrt{16} = 4$. Each is an integer, so each is rational ($\frac{1}{1}, \frac{2}{1}$, etc.). Any three of these disprove the claim. ✓

# Chapter 2

## Quiz 2: Graphing Proportional Relationships

1 B (2)

2 24 and 40

3 False

4 $<$

5 $y = 4x$

6 7

7 Store B; $25

## Explanations

1 For a proportional relationship $y = kx$, pick any point on the line: $k = \frac{y}{x} = \frac{6}{3} = 2$. Common mistake: choosing $k = 3$ (the $x$-value) or $k = 6$ (the $y$-value) instead of dividing $y \div x$. ✓

**2** *The unit rate is $k = 8$ miles per hour. At 3 h: $8 \times 3 = 24$ mi. At 5 h: $8 \times 5 = 40$ mi. In a proportional table, multiply each $x$-value by $k$.* ✓

**3** *A proportional relationship has the form $y = kx$ and passes through the origin $(0, 0)$. The equation $y = 5x + 2$ has a $y$-intercept of 2, so at $x = 0$ we get $y = 2$, not 0. That extra $+2$ means it is **not** proportional.* ✓

**4** *Pipe A: $\frac{36}{4} = 9$ gal/min. Pipe B: $\frac{50}{5} = 10$ gal/min. Since $9 < 10$, Pipe A's rate is **less than** Pipe B's rate. Common mistake: comparing totals (36 vs 50) instead of unit rates.* ✓

**5** *Find $k$: $k = \frac{y}{x} = \frac{20}{5} = 4$. So the equation is $y = 4x$. Check: $y = 4(5) = 20$.* ✓

**6** *Unit rate: $\frac{2}{50} = 0.04$ gal/mi (or $\frac{50}{2} = 25$ mi/gal). For 175 mi: $175 \div 25 = 7$ gallons. Alternatively, set up a proportion: $\frac{2}{50} = \frac{x}{175}$, so $x = \frac{2 \times 175}{50} = 7$.* ✓

**7** *Store A: $k = 3$ ($3/lb). Store B: $k = \frac{5}{2} = 2.50$ ($2.50/lb). Since $\$2.50 < \$3.00$, Store B is cheaper. At 10 lb: $10 \times 2.50 = \$25$. Check Store A: $10 \times 3 = \$30$ — that's $5 more.* ✓

***Well done checking your answers!***

*Keep practicing to strengthen your skills.*

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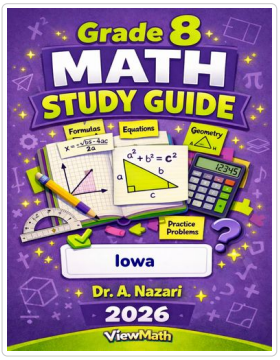
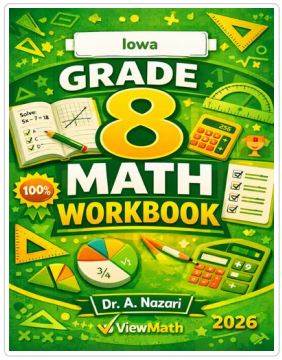



*Study Guide*

Scan Me




*Workbook*

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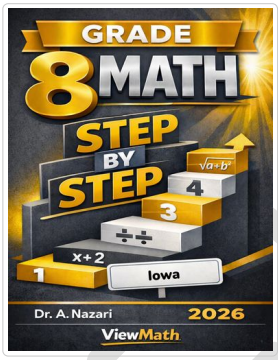


*Step-by-Step*

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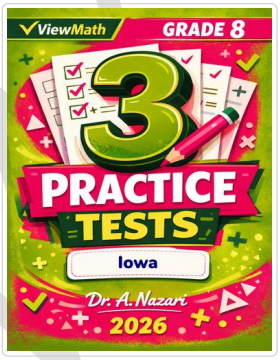


*3 Practice Tests*

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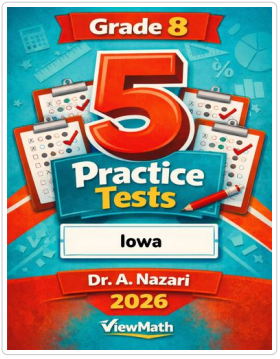


*5 Practice Tests*

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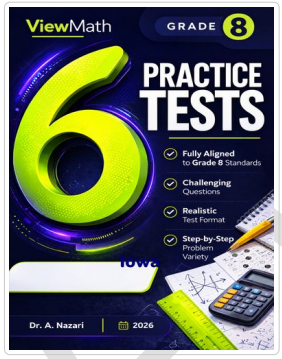


*6 Practice Tests*

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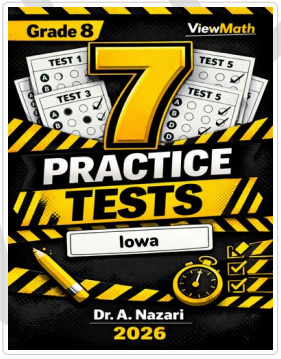


*7 Practice Tests*

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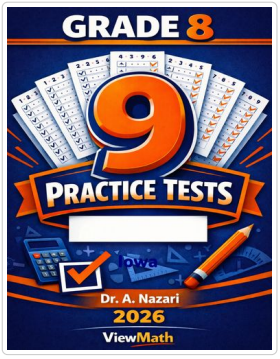


*9 Practice Tests*

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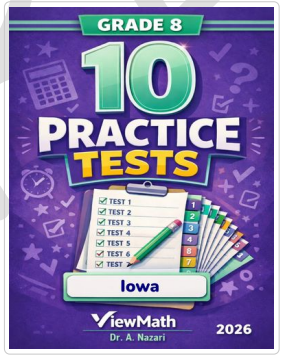


*10 Practice Tests*

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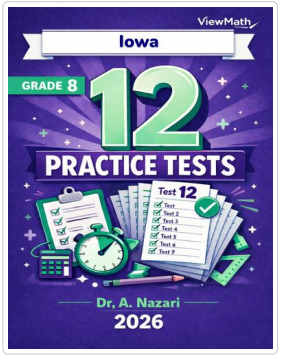


*12 Practice Tests*

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THANK YOU

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