

# Texas STAAR Grade 8 Math Workbook

*Practice Problems & Exercises with Answer Key*

**Dr. A. Nazari**

Copyright © 2026 Dr. A. Nazari

Published by View Math Education

ViewMath.com

All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the author, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law, including Section 107 or 108 of the 1976 United States Copyright Act.

The information in this book is distributed on an “as is” basis, without warranty. While every precaution has been taken in the preparation of this work, neither the author nor the publisher shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this book.

*Copyright © 2026*

PRACTICE MAKES PERMANENT

# Grade 8 Math Workbook

Practice Problems • Word Problems • Complete Answer Key

---

*Grade 8 math marks the bridge between middle school arithmetic and high-school algebra. This workbook gives you focused practice on every topic — from irrational numbers and exponents to linear equations, functions, geometry transformations, and data analysis.*

*Work through each section at your own pace, show every step, then check the answer key in the back. Mistakes are not failures — they are the moments where real learning happens.*

 **32 Topics Across 6 Chapters**

*Irrational numbers, scientific notation, linear equations, functions, geometry, and data analysis — every Grade 8 standard.*

 **Progressive Difficulty**

*Each topic builds from foundational recall to multi-step reasoning.*

 **Real-World Applications**

*Apply your skills to science, engineering, finance, and everyday problem solving.*

 **Complete Answer Key**

*Every problem has a detailed answer in the back. Check your work, identify mistakes, and strengthen weak spots.*

© 2026 Dr. A. Nazari • ViewMath.com



Get Online



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



# How to Use This Workbook

Four steps to get the most out of every section.

1

## Read the Quick Review

Every topic opens with a brief reminder of the key idea or formula. If something feels unfamiliar, pair this workbook with the matching study guide for a full explanation before diving into problems.

2

## Work the Problems in Order

Problems are arranged from straightforward to challenging. Starting with the easier ones builds momentum and warms up your thinking before the tougher questions arrive.

3

## Show Every Step

Write out your reasoning on scratch paper. When an answer is wrong, your written work reveals exactly where the logic broke down — and that is the fastest way to fix it.

4

## Check Answers and Reflect

After finishing a section, flip to the Answer Key and mark every problem. For each mistake, figure out why it happened. Then try a similar problem again until it clicks.



### Suggested Weekly Routine

- **Mon–Thu:** One topic per day (20–30 minutes).
- **Friday:** Review the week's mistakes and redo missed problems.
- **Weekend:** Rest — or tackle a challenge problem!



### Tips for Parents & Teachers

- Let your student work independently first.
- Review mistakes together — focus on why, not just the answer.
- Praise effort and persistence, not just correct answers.

 **Pair It Up**

*This workbook focuses on practice. For detailed explanations, worked examples, and teaching notes, use it alongside the Grade 8 Math Study Guide or your classroom textbook.*

PREVIEW



Get Online



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



# What You'll Need

*Gather these supplies before you start.*



## **Pencils**

*Mechanical or sharpened*



## **Eraser**

*Good erasers save time*



## **Graph Paper**

*For graphing & coordinates*



## **Ruler & Protractor**

*For geometry sections*



## **Scientific Calculator**

*For checking, not shortcuts*



## **A Focused Mindset**

*Persistence is the key*

### **A Note for Parents & Teachers**

- *This workbook pairs perfectly with the **Grade 8 Math Study Guide**. Use the Study Guide to learn concepts, then this workbook for focused practice.*
- *Topics follow the same order as the Study Guide for easy cross-reference.*
- *Keep sessions to 20–30 minutes for best focus and retention.*
- *Encourage students to show all work — the process matters as much as the answer.*
- *Celebrate progress. Even a few problems each day builds lasting math confidence.*

# Math Symbols & Vocabulary

*A quick reference you can come back to any time.*

## X<sup>1</sup> Key Symbols & Notation

Symbol	Name	What It Means	
$a^n$	Exponent	$a$ multiplied by itself $n$ times.	$2^3 = 8$
$\sqrt{\quad}$	Square Root	The number that, multiplied by itself, gives the original.	$\sqrt{49} = 7$
$\sqrt[3]{\quad}$	Cube Root	The number whose cube equals the original.	$\sqrt[3]{27} = 3$
$ x $	Absolute Value	Distance from zero on the number line.	$ -5  = 5$
$\approx$	Approximately Equal	Close in value but not exact.	$\pi \approx 3.14$
$\neq$	Not Equal To	The two sides are different.	$3 \neq 5$
$\leq, \geq$	Less/Greater or Equal	Includes the boundary value.	$x \leq 10$
$f(x)$	Function Notation	The output of function $f$ for input $x$ .	$f(3) = 7$

### Key Vocabulary for Grade 8

- **Rational number** — can be written as  $\frac{a}{b}$
- **Irrational number** — non-repeating, non-terminating decimal
- **Scientific notation** —  $a \times 10^n$  form
- **Slope** — steepness of a line ( $\frac{\text{rise}}{\text{run}}$ )
- **y-intercept** — where a line crosses the y-axis
- **System of equations** — two or more equations together
- **Function** — each input maps to exactly one output
- **Linear** — constant rate of change; a straight line
- **Nonlinear** — rate of change varies; curved graph
- **Transformation** — move, flip, rotate, or resize a figure
- **Congruent** — same shape and size
- **Similar** — same shape, different size (proportional)
- **Hypotenuse** — longest side of a right triangle
- **Scatter plot** — graph showing data point pairs

### Useful Number Facts

Fraction	Decimal	Percent	
$\frac{1}{2} = 0.5 = 50\%$	$\frac{1}{3} \approx 0.333 = 33.\bar{3}\%$	$\frac{1}{4} = 0.25 = 25\%$	
$\frac{1}{5} = 0.2 = 20\%$	$\frac{1}{8} = 0.125 = 12.5\%$	$\frac{3}{4} = 0.75 = 75\%$	
$\pi \approx 3.14159$	$\sqrt{2} \approx 1.414$	$\sqrt{3} \approx 1.732$	$\sqrt{5} \approx 2.236$



Find more at  
[ViewMath.com/Grade8](http://ViewMath.com/Grade8)



# Grade 8 Formula Reference

Keep this page handy — you may use it during your practice tests!

## Exponent Rules

$$a^m \cdot a^n = a^{m+n} \quad (a^m)^n = a^{mn} \quad (ab)^n = a^n \cdot b^n$$
$$\frac{a^m}{a^n} = a^{m-n} \quad a^0 = 1 \quad (a \neq 0) \quad a^{-n} = \frac{1}{a^n}$$

## Lines & Linear Equations

**Slope:**  $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$

$m$  = slope     $b$  =  $y$ -intercept

**Slope-intercept:**  $y = mx + b$

Parallel lines: same slope

**Proportional:**  $y = mx$

Proportional: passes through origin

## Scientific Notation

$a \times 10^n$  where  $1 \leq |a| < 10$

**Multiply:** add exponents

**Divide:** subtract exponents

## Roots & Number Sense

**Perfect squares:** 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

**Perfect cubes:** 1, 8, 27, 64, 125       $\sqrt{2} \approx 1.414$        $\sqrt{3} \approx 1.732$        $\pi \approx 3.14159$

## Pythagorean Theorem & Distance

$a^2 + b^2 = c^2$      $c$  = hypotenuse (longest side of a right triangle)    **Distance:**  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

## Volume Formulas

**Cylinder**  $V = \pi r^2 h$       **Cone**  $V = \frac{1}{3} \pi r^2 h$       **Sphere**  $V = \frac{4}{3} \pi r^3$

### Angle Relationships

**Triangle angle sum:**  $180^\circ$

**Exterior angle** = sum of two remote interior angles

**Parallel lines + transversal:** Alternate interior angles are equal • Co-interior angles sum to  $180^\circ$

### Functions

Each input  $\rightarrow$  exactly one output    **Vertical line test:** if any vertical line hits graph more than once  $\Rightarrow$  not a function

**Linear:** constant rate of change ( $y = mx + b$ )

**Nonlinear:** rate of change varies

### Transformations

**Translation:** slide

**Reflection:** flip

**Rotation:** turn

**Dilation:** resize

Congruent = same shape & size

Similar = same shape, proportional size



**Tip:** Bookmark this page! Review it before each test so these formulas become second nature.



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



# My Progress Log

Track your work through every chapter and topic.

This book belongs to: \_\_\_\_\_

 Chapter 1: Irrational Numbers

Done  Score: \_\_\_\_\_ / \_\_\_\_\_

 Chapter 2: Powers, Roots, & Scientific Notation

Done  Score: \_\_\_\_\_ / \_\_\_\_\_

 Chapter 3: Lines and Linear Equations

Done  Score: \_\_\_\_\_ / \_\_\_\_\_

 Chapter 4: Functions

Done  Score: \_\_\_\_\_ / \_\_\_\_\_

 Chapter 5: Geometry

Done  Score: \_\_\_\_\_ / \_\_\_\_\_

 Chapter 6: Data and Relationships

Done  Score: \_\_\_\_\_ / \_\_\_\_\_

 My Goal

I want to finish \_\_\_\_\_ topics each week.

Target date:

\_\_\_\_\_



# ★ *Table of Contents* ★

*Here's what we'll explore together!*

★ 1	<i>Irrational Numbers</i> .....	2
★ 2	<i>Lines and Linear Equations</i> .....	7
★	<i>Answer Key</i> .....	13



*Let's learn and have fun!*

PREVIEW



CHAPTER

1

# *Irrational Numbers*

## ★ *What's Inside* ★

<b>1.1</b> <i>Rational and Irrational Numbers</i> .....	<b>3</b>
---	----------



## ★ 1.1 Rational and Irrational Numbers ★

### Rational and Irrational Numbers

#### Quick Review: Rational, Irrational, and the Real Number Subsets

A **rational number** can be written as  $\frac{a}{b}$  where  $a$  and  $b$  are integers and  $b \neq 0$ . An **irrational number** cannot be written as a fraction of two integers.

- **Natural numbers:**  $1, 2, 3, \dots$  (counting numbers)
- **Whole numbers:**  $0, 1, 2, 3, \dots$  (naturals plus zero)
- **Integers:**  $\dots, -2, -1, 0, 1, 2, \dots$
- **Rational numbers:** any  $\frac{a}{b}$  with integer  $a, b$  and  $b \neq 0$
- **Irrational numbers:** non-terminating, non-repeating decimals ( $\sqrt{2}, \pi$ )

**Subset chain:**  $\text{Natural} \subset \text{Whole} \subset \text{Integer} \subset \text{Rational} \subset \text{Real}$ . Irrational numbers are also Real but sit *outside* the Rational set.

**Example:** 7 is Natural, Whole, Integer, Rational, and Real.  $\sqrt{5}$  is Irrational and Real only.

#### Warm-Up

##### Rational or Irrational?

Write **Rational** or **Irrational** for each number.



Get Online



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



1.  $\frac{5}{8}$  \_\_\_\_\_

4.  $-7$  \_\_\_\_\_

2.  $\sqrt{16}$  \_\_\_\_\_

5.  $0.\bar{6}$  \_\_\_\_\_

3.  $\pi$  \_\_\_\_\_

6.  $\sqrt{7}$  \_\_\_\_\_

 **Classify into All Real Number Subsets** 

List Every Subset Each Number Belongs To

Choose from: Natural, Whole, Integer, Rational, Irrational, Real.

7. 12 \_\_\_\_\_

8. 0 \_\_\_\_\_

9.  $-5$  \_\_\_\_\_

10.  $\frac{3}{4}$  \_\_\_\_\_

11.  $\sqrt{2}$  \_\_\_\_\_

12.  $\sqrt{49}$  \_\_\_\_\_

 **More Subset Classification** 

13.  $-\frac{2}{3}$  \_\_\_\_\_

14.  $0.\bar{3}$  \_\_\_\_\_

15.  $\sqrt{100}$  \_\_\_\_\_

16.  $-\sqrt{3}$  \_\_\_\_\_



Get Online



Find more at  
[ViewMath.com/Grade8](http://ViewMath.com/Grade8)



 True or False? 

17. Every whole number is a rational number.

True  False

18. The number  $\sqrt{9}$  is irrational.

True  False

19. All decimals that go on forever are irrational.

True  False

20. Zero is a natural number.

True  False

21. An irrational number is a real number.

True  False

  Word Problems 

22. Marcus says that  $\sqrt{50}$  is rational because it simplifies to  $5\sqrt{2}$ . Is Marcus correct? Explain.

Answer: \_\_\_\_\_

23. A teacher asks: "Name a number that is an integer but NOT a whole number." Give an example and explain why it works.

Answer: \_\_\_\_\_

24. A calculator shows 0.142857142857... for a division problem. Is the result rational or irrational? List all subsets it belongs to.

Answer: \_\_\_\_\_



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



 **Challenge!**

25. Is  $\sqrt{2} + \sqrt{2}$  rational or irrational? List all subsets. Justify your answer.
26. Give an example of a number that is rational but belongs to NO other subset except Real. Explain.

*Amazing work classifying numbers! You know  
the real number family tree inside and out!*



Get Online



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



CHAPTER

2

# *Lines and Linear Equations*

## ★ *What's Inside* ★

<i>2.1 Graphing Proportional Relationships</i> .....	<b>8</b>
--	----------



## ★ 2.1 Graphing Proportional Relationships ★

### Graphing Proportional Relationships

#### Quick Review: Direct Variation

A **direct variation** is a proportional relationship with equation  $y = kx$ , where  $k$  is the **constant of proportionality**.

- On a graph, a direct variation is a **straight line through the origin**  $(0, 0)$ .
- **Test from a table:** divide  $\frac{y}{x}$  for every row. If the ratio is always the same, it's proportional.
- **Not proportional:** if the line doesn't pass through the origin, or  $\frac{y}{x}$  changes.

**Example:**  $x = 2, y = 6$ ;  $x = 4, y = 12$ ;  $x = 6, y = 18$ . Ratios:  $\frac{6}{2} = \frac{12}{4} = \frac{18}{6} = 3$ . Direct variation:  $y = 3x$ .

### Warm-Up

#### Find the Constant of Proportionality

1. A car drives 180 miles in 3 hours. Find  $k$ .  $k$ . \_\_\_\_\_  
\_\_\_\_\_
2. A graph passes through  $(5, 30)$ . Find  $k$ .  
\_\_\_\_\_
3. A machine fills 24 bottles in 4 minutes. Find \_\_\_\_\_
4. A graph passes through  $(8, 20)$ . Find  $k$ .  
\_\_\_\_\_
5. A recipe uses 6 eggs for 3 cakes. Find  $k$ .  
\_\_\_\_\_



Get Online



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



 [ViewMath.com](https://www.viewmath.com)



## Proportional or Not?

### Check the Ratios

Determine whether each table shows a direct variation. If yes, write the equation.

6. 

$x$	1	2	3	4
$y$	5	10	15	20

\_\_\_\_\_

7. 

$x$	1	2	3	4
$y$	3	7	11	15

\_\_\_\_\_

8. 

$x$	2	4	6	8
$y$	7	14	21	28

\_\_\_\_\_

9. 

$x$	1	3	5	7
$y$	4	10	16	22

\_\_\_\_\_

10. 

$x$	3	6	9	12
$y$	12	24	36	48

\_\_\_\_\_

## Write the Equation

Each point lies on a direct variation. Write the equation  $y = kx$ .

11.  $(4, 16)$  \_\_\_\_\_

13.  $(10, 30)$  \_\_\_\_\_

12.  $(6, 15)$  \_\_\_\_\_

14.  $(5, 8)$  \_\_\_\_\_



Get Online



Find more at  
[ViewMath.com/Grade8](http://ViewMath.com/Grade8)



### Comparing Relationships

15. Painter A:  $y = 40x$  (square feet per hour). Painter B paints 150 sq ft in 5 hours. Who is faster?
16. Shop A sells fabric at \$8 per yard. Shop B sells 6 yards for \$42. Which has the lower price?
17. Faucet A fills a tank through (3, 18) on a gallons-per-minute graph. Faucet B:  $y = 5x$ . Which fills faster?

### True or False?

18. Every direct variation passes through the origin. True  False
19. The equation  $y = 2x + 1$  is a direct variation. True  False
20. If  $\frac{y}{x}$  is the same for every row in a table, the relationship is proportional. True  False
21. A direct variation can have  $k = 0$ . True  False

### Word Problems

22. A hose fills a pool at a constant rate. After 8 minutes, there are 120 gallons. Write the direct variation equation. How many gallons after 15 minutes?

Answer: \_\_\_\_\_ gallons

23. A proportional graph passes through (6, 27). What is the  $y$ -value when  $x = 10$ ?

Answer: \_\_\_\_\_



Get Online



Find more at  
[ViewMath.com/Grade8](http://ViewMath.com/Grade8)



 **Challenge!**

24. The point  $(a, 28)$  lies on the graph of  $y = 7x$ . Find  $a$ .
25. A plant grows proportionally. At day 3 it is 9 cm tall. At day  $d$  it is 24 cm. Find  $d$ .

*You understand direct variation inside and out — keep up the great work!*



Get Online



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



# *Answer Key*



## Answer Key

Try each problem on your own first, then check your work here.

### Chapter 1

#### > Section 1.1

1 Rational

2 Rational

3 Irrational

4 Rational

5 Rational

6 Irrational

7 Natural, Whole, Integer, Rational, Real

8 Whole, Integer, Rational, Real

9 Integer, Rational, Real

10 Rational, Real

11 Irrational, Real

12 Natural, Whole, Integer, Rational, Real

13 Rational, Real

14 Rational, Real

15 Natural, Whole, Integer, Rational, Real

16 Irrational, Real

17 True

18 False

19 False

20 False

21 True

22 No, Marcus is incorrect

23  $-1$  (or any negative integer)

24 Rational, Real

25 Irrational, Real

26  $\frac{1}{2}$  (or any non-integer fraction)

#### Explanations

1  $\frac{5}{8}$  is a fraction of two integers (5 and 8), so it is rational. Its decimal is 0.625, which terminates.



Get Online



Find more at  
[ViewMath.com/Grade8](http://ViewMath.com/Grade8)



2  $\sqrt{16} = 4$ , which is an integer. Every integer can be written as a fraction, so it is rational.

3  $\pi = 3.14159\dots$  is a non-terminating, non-repeating decimal. It cannot be written as  $\frac{a}{b}$ .

4  $-7 = \frac{-7}{1}$ . Since it can be expressed as a fraction of two integers, it is rational.

5  $0.\bar{6} = 0.666\dots$  is a repeating decimal. Repeating decimals are always rational. In fact,  $0.\bar{6} = \frac{2}{3}$ .

6 7 is not a perfect square, so  $\sqrt{7}$  cannot be written as a fraction. Its decimal never terminates or repeats.

7 12 is a counting number, so it belongs to every subset on the rational side: Natural, Whole, Integer, Rational, and Real.

8 0 is a whole number but not a natural number (naturals start at 1). It is also an integer, rational ( $\frac{0}{1}$ ), and real.

9  $-5$  is negative, so it is not natural or whole. It is an integer, rational ( $\frac{-5}{1}$ ), and real.

10  $\frac{3}{4} = 0.75$  is a fraction of two integers. It is not an integer (it falls between 0 and 1), so it is only rational and real.

11 2 is not a perfect square, so  $\sqrt{2} = 1.4142\dots$  cannot be written as a fraction. It is irrational and real.

12  $\sqrt{49} = 7$ , which is a counting number. It belongs to Natural, Whole, Integer, Rational, and Real.

13  $-\frac{2}{3}$  is a fraction of two integers. It is negative and not an integer, so it is only rational and real.



Get Online



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



14  $0.\overline{3} = \frac{1}{3}$ , a fraction of two integers. It is rational and real, but not an integer, whole, or natural number.

15  $\sqrt{100} = 10$ , a counting number. It belongs to every subset on the rational branch: Natural, Whole, Integer, Rational, and Real.

16  $\sqrt{3}$  is irrational, and multiplying by  $-1$  does not change that.  $-\sqrt{3}$  is irrational and real.

17 Every whole number  $n$  can be written as  $\frac{n}{1}$ , which is a fraction of two integers. So every whole number is rational.

18  $\sqrt{9} = 3$ , which is an integer. Integers are rational, not irrational.

19 Repeating decimals go on forever but are rational. For example,  $0.\overline{3} = \frac{1}{3}$  is rational. Only non-repeating, non-terminating decimals are irrational.

20 Natural numbers are the counting numbers:  $1, 2, 3, \dots$ . Zero is a whole number but not a natural number.

21 The real numbers include both rational and irrational numbers. Every point on the number line is a real number; and irrational numbers have a place on the number line.

22 Simplifying  $\sqrt{50}$  to  $5\sqrt{2}$  does not make it rational. The factor  $\sqrt{2}$  is irrational, and multiplying an irrational number by a non-zero rational ( $5$ ) still gives an irrational result. So  $\sqrt{50}$  is irrational.

23 Whole numbers are  $0, 1, 2, 3, \dots$ . Integers also include negatives. Any negative integer, such as  $-1$ , is an integer but not a whole number because whole numbers are non-negative.

24 The digits 142857 repeat in a cycle. A repeating decimal equals a fraction (this one is  $\frac{1}{7}$ ). It is rational and real, but not an integer, whole, or natural number.



Get Online



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



25  $\sqrt{2} + \sqrt{2} = 2\sqrt{2}$ . Since  $\sqrt{2}$  is irrational and 2 is a non-zero rational number, the product  $2\sqrt{2}$  is still irrational. It belongs to Irrational and Real only.

26  $\frac{1}{2} = 0.5$  is rational (fraction of integers) and real, but it is not an integer, whole, or natural number because it falls between 0 and 1. It is also not irrational. So its only subsets are Rational and Real.

## Chapter 2

### > Section 2.1

1 60 mph

2 6

3 6 bottles/min

4 2.5

5 2 eggs/cake

6 Yes;  $y = 5x$

7 No

8 Yes;  $y = 3.5x$

9 No

10 Yes;  $y = 4x$

11  $y = 4x$

12  $y = 2.5x$

13  $y = 3x$

14  $y = 1.6x$

15 Painter A

16 Shop B

17 Faucet A

18 True

19 False

20 True

21 False

22  $y = 15x$ ; 225 gallons

23 45

24 4

25 8

### Explanations

1  $k = \frac{180}{3} = 60$  miles per hour.

2  $k = \frac{y}{x} = \frac{30}{5} = 6$ .

3  $k = \frac{24}{4} = 6$  bottles per minute.

4  $k = \frac{20}{8} = 2.5$ .



Get Online



Find more at  
[ViewMath.com/Grade8](http://ViewMath.com/Grade8)



 [ViewMath.com](http://ViewMath.com)



- 5  $k = \frac{6}{3} = 2$  eggs per cake.
- 6  $\frac{5}{1} = \frac{10}{2} = \frac{15}{3} = \frac{20}{4} = 5$ . The ratio is constant, so  $y = 5x$ .
- 7  $\frac{3}{1} = 3$ ,  $\frac{7}{2} = 3.5$ . The ratios differ, so this is not a direct variation.
- 8  $\frac{7}{2} = \frac{14}{4} = \frac{21}{6} = \frac{28}{8} = 3.5$ . Direct variation:  $y = 3.5x$ .
- 9  $\frac{4}{1} = 4$ ,  $\frac{10}{3} \approx 3.33$ . The ratios are not equal, so it is not proportional.
- 10  $\frac{12}{3} = \frac{24}{6} = \frac{36}{9} = \frac{48}{12} = 4$ . Direct variation:  $y = 4x$ .
- 11  $k = \frac{16}{4} = 4$ , so  $y = 4x$ .
- 12  $k = \frac{15}{6} = 2.5$ , so  $y = 2.5x$ .
- 13  $k = \frac{30}{10} = 3$ , so  $y = 3x$ .
- 14  $k = \frac{8}{5} = 1.6$ , so  $y = 1.6x$ .
- 15 Painter A:  $k = 40$  sq ft/hr. Painter B:  $k = \frac{150}{5} = 30$  sq ft/hr. Painter A is faster.
- 16 Shop A:  $k = 8$  per yard. Shop B:  $k = \frac{42}{6} = 7$  per yard. Shop B is cheaper at \$7/yd.
- 17 Faucet A:  $k = \frac{18}{3} = 6$  gal/min. Faucet B:  $k = 5$  gal/min. Faucet A is faster.
- 18  $y = kx$  gives  $y = 0$  when  $x = 0$ , so the graph always passes through  $(0, 0)$ .



Get Online

Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)

19 Direct variations have the form  $y = kx$ . The  $+1$  means the graph does not pass through the origin.

20 A constant ratio  $\frac{y}{x} = k$  is precisely the definition of a proportional (direct variation) relationship.

21 If  $k = 0$ , then  $y = 0$  for all  $x$ , which is just the  $x$ -axis. While technically  $y = 0 \cdot x$  satisfies the form, it does not represent a meaningful proportional relationship between two varying quantities.

22  $k = \frac{120}{8} = 15$ . Equation:  $y = 15x$ . At 15 min:  $y = 15 \times 15 = 225$  gallons.

23  $k = \frac{27}{6} = 4.5$ . When  $x = 10$ :  $y = 4.5 \times 10 = 45$ .

24  $28 = 7a$ , so  $a = \frac{28}{7} = 4$ .

25  $k = \frac{9}{3} = 3$  cm/day. Solve  $24 = 3d$ :  $d = 8$ .



**Well done checking your answers!**

*Keep practicing to strengthen your skills.*



Find more at  
[ViewMath.com/Grade8](https://www.viewmath.com/Grade8)



THANK YOU

# Enjoyed This Preview?

## Get the Full Book!

*This preview shows just a small sample of what's inside.*

*The complete book includes:*

- ✓ *All chapters and topics*
- ✓ *Hundreds of practice problems*
- ✓ *Complete answer key with explanations*
- ✓ *Colorful visuals and step-by-step examples*
- ✓ *Reference sheets and progress trackers*

 Visit us at [ViewMath.com](https://www.viewmath.com) for free resources and more books!