
Table of Contents

Introduction.....	v
Materials List	viii
Number and Operations	1
Set 1: Rational and Irrational Numbers.....	1
Set 2: Comparing and Ordering Numbers.....	8
Set 3: Simplifying, Adding and Subtracting Square Roots	15
Set 4: Simplifying, Multiplying and Dividing Square Roots.....	22
Set 5: Problem Solving with Exponents and Scientific Notation	29
Geometry and Measurement	37
Set 1: Parallel and Perpendicular Lines	37
Set 2: Properties of Angle Pairs.....	44
Set 3: Properties of Lines Cut by Transversals.....	51
Set 4: Properties of Right Triangles	58
Set 5: Understanding the Pythagorean Theorem.....	65
Algebra.....	73
Set 1: Representing Patterns and Relationships	73
Set 2: Graphing Relationships	80
Set 3: Evaluating and Simplifying Expressions	89
Set 4: Solving Equations	96
Set 5: Solving Inequalities.....	103
Data Analysis and Probability.....	113
Set 1: Using Tree Diagrams	113
Set 2: Using Venn Diagrams	121
Set 3: Probability of Independent Events	128
Set 4: Probability of Compound Events.....	135
Set 5: Applying Probability.....	143

Introduction

This book includes a collection of station-based activities to provide students with opportunities to practise and apply the mathematical skills and concepts they are learning. It contains five sets of activities for each of the four strands: Number and Operations; Geometry and Measurement; Algebra; and Data Analysis and Probability. You may use these activities in addition to the direct instruction lessons, or, especially if the pre-test or other formative assessment suggests it, instead of direct instruction in areas where students have the basic concepts but need practice. The debriefing discussions after each set of activities provide an important opportunity to help students reflect on their experiences and synthesise their thinking. It also provides an additional opportunity for ongoing, informal assessment to inform instructional planning.

Implementation Guide

The following guidelines will help you prepare for and use the activity sets in this book.

Setting Up the Stations

Each activity set consists of four or more stations. Set up each station at a desk, or at several desks pushed together, with enough chairs for a small group of students. Place a card with the number of the station on the desk. Each station should also contain the materials specified in the teacher's notes, and a stack of Student Activity Sheets (one copy per student). Place the required materials (as listed) at each station.

When a group of students arrives at a station, each student should take one of the activity sheets to record the group's work. Although students should work together to develop one set of answers for the entire group, each student should record the answers on his or her own activity sheet. This helps keep students engaged in the activity and gives each student a record of the activity for future reference.

Forming Groups of Students

All activity sets consist of four stations. You might divide the class into four groups by having students count from 1 to 4. If you have a large class and want to have students working in small groups, you might set up two identical sets of stations, labelled A and B. In this way, the class can be divided into eight groups, with each group of students rotating to the "A" stations or "B" stations.

Geometry and Measurement

Set 1: Parallel and Perpendicular Lines

Instruction

Station 3

Students are given 18 cards with different equations written on them. They sort through the cards to find pairs of parallel and perpendicular lines, and then discuss their strategies for completing the activity.

Answers: Parallel: $y = 7x - 4$ and $y = 7x + 8$, $y = -\frac{1}{2}x - 11$ and $y = -\frac{1}{2}x + 16$, $y = 4x + 1$ and $y = 4x$, $y = 0$ and $y = 12$, $y = x$ and $y = x - 9$; Perpendicular: $y = \frac{1}{4}x - 3$ and $y = -4x + 12$, $y = -\frac{11}{2}x - 4$ and $y = \frac{2}{11}x$, $y = 3x - 2$ and $y = -\frac{1}{3}x + 4$, $y = x + 4$, $y = -x - 3$; answers will vary – looking at the slopes for same or negative reciprocals

Station 4

Students use geoboards to construct polygons with parallel and perpendicular sides. They then reflect on the properties of parallel and perpendicular lines, and explain how this knowledge helped them complete the task.

Answers: First, make the parallel or perpendicular lines then connect them; You needed to know that perpendicular lines meet at right angles and that parallel lines have the same slope.

Materials List/Set Up

Station 1 ruler for each group member

Station 2 ruler and protractor for each group member

Station 3 18 cards with the following equations written on them:

$y = 7x - 4$, $y = 7x + 8$, $y = -\frac{1}{2}x - 11$, $y = -\frac{1}{2}x + 16$, $y = 4x + 1$, $y = 4x$, $y = 0$, $y = 12$, $y = x$, $y = x - 9$, $y = \frac{1}{4}x - 3$, $y = -4x + 12$, $y = -\frac{11}{2}x - 4$, $y = \frac{2}{11}x$, $y = 3x - 2$, $y = -\frac{1}{3}x + 4$, $y = x + 4$, $y = -x - 3$

Station 4 geoboard, rubber bands

Discussion Guide

To support students in reflecting on the activities and to gather some formative information about student learning, use the following prompts to facilitate a class discussion to “debrief” the station activities.

Prompts/Questions

1. What is true about the slopes of perpendicular lines?
2. How can you tell two lines are parallel by looking at their equations?
3. What is an example of a real-life situation when you want to make sure you have parallel lines?
4. What is an example of a real-life situation when you want to make sure you have perpendicular lines?

Think, Pair, Share

Have students jot down their own responses to questions, discuss with a partner (who was not in their station group) and then discuss as a whole class.

Suggested Appropriate Responses

1. They are negative reciprocals.
2. They have the same slope.
3. Many possibilities – lanes on a road
4. Many possibilities – walls and floor in a house

Possible Misunderstandings/Mistakes

- Not properly determining the slope of a line
- Not realising that $y = \text{constant}$ and $x = \text{constant}$ are perpendicular
- Thinking the y -intercepts affects parallelism

NAME: _____

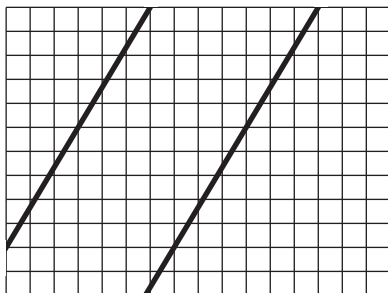
Geometry and Measurement

Set 1: Parallel and Perpendicular Lines

Station 1

At this station, you will find rulers. Use these to help you determine whether or not the following lines are parallel.

Look at the graph below.

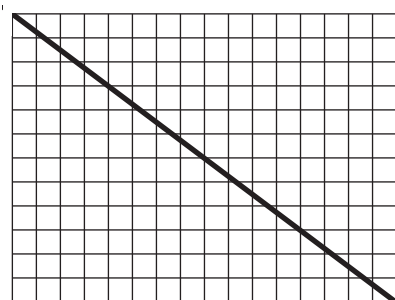


Are these lines parallel? _____

Explain two ways you can tell lines are parallel.

What is the distance between these two lines? _____

Draw a line that is parallel to the given line.



How do you know your line is parallel?
