
Chapter 3

Model With Vectors

Curriculum Expectations

Applications of Geometry

Modelling with Vectors

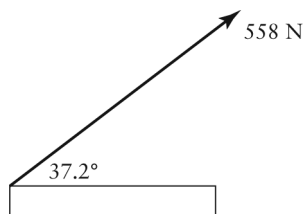
D1.1 recognize a vector as a quantity with both magnitude and direction, and identify, gather, and interpret information about real-world applications of vectors (e.g., displacement; forces involved in structural design; simple animation of computer graphics; velocity determined using GPS)

Sample problem: Position is represented using vectors. Explain why knowing that someone is 69 km from Lindsay, Ontario, is not sufficient to identify their exact position.

D1.2 represent a vector as a directed line segment, with directions expressed in different ways (e.g., 320° ; N 40° W), and recognize vectors with the same magnitude and direction but different positions as equal vectors

D1.3 resolve a vector represented as a directed line segment into its vertical and horizontal components

Sample problem: A cable exerts a force of 558 N at an angle of 37.2° with the horizontal. Resolve this force into its vertical and horizontal components.



D1.4 represent a vector as a directed line segment, given its vertical and horizontal components (e.g., the displacement of a ship that travels 3 km east and 4 km north can be represented by the vector with a magnitude of 5 km and a direction of N 36.9° E)

D1.5 determine, through investigation using a variety of tools (e.g., graph paper, technology) and strategies (i.e., head-to-tail method; parallelogram method; resolving vectors into their vertical and horizontal components), the sum (i.e., resultant) or difference of two vectors

D1.6 solve problems involving the addition and subtraction of vectors, including problems arising from real-world applications (e.g., surveying, statics, orienteering)

Sample problem: Two people pull on ropes to haul a truck out of some mud. The first person pulls directly forward with a force of 400 N, while the other person pulls with a force of 600 N at a 50° angle to the first person along the horizontal plane. What is the resultant force used on the truck?

Chapter 3 Planning Chart

Section	Study Guide and Exercise Book Pages	Teacher's Resource Blackline Masters	Assessment	Tools
3.1 Vectors	44–46	<ul style="list-style-type: none"> G–1 Grid Paper T–2 <i>The Geometer's Sketchpad</i>® 4 BLM 3–1 Chapter 3 Prerequisite Skills T3–1 How to Do Section 3.1 #10 Using <i>The Geometer's Sketchpad</i>® T3–2 How to Do Section 3.1 #10 Using TI-83 Plus/TI-84 Plus and TI-Nspire™ CAS 	<ul style="list-style-type: none"> BLM 3–2 Self-Assessment Checklist A–1 Problem Solving A–2 Reasoning and Proving A–3 Reflecting A–4 Selecting Tools and Computational Strategies A–5 Connecting A–6 Representing A–7 Communicating 	<ul style="list-style-type: none"> grid paper ruler protractor items to create a spinner, such as a piece of wire, a paper clip, or a piece of string graphing calculator computer with dynamic geometry software
3.2 Components of Vectors	47–49	<ul style="list-style-type: none"> G–1 Grid Paper T–2 <i>The Geometer's Sketchpad</i>® 4 T3–3 How to Do Section 3.2 #3a) and b) Using <i>The Geometer's Sketchpad</i>® 		<ul style="list-style-type: none"> grid paper ruler protractor computer with dynamic geometry software
3.3 Adding Vectors	50–53	<ul style="list-style-type: none"> G–1 Grid Paper T–2 <i>The Geometer's Sketchpad</i>® 4 T3–4 How to Do Section 3.3 #2 Using <i>The Geometer's Sketchpad</i>® 		<ul style="list-style-type: none"> grid paper ruler protractor computer with dynamic geometry software
3.4 Subtracting Vectors	54–56	<ul style="list-style-type: none"> G–1 Grid Paper T–2 <i>The Geometer's Sketchpad</i>® 4 T3–5 How to Do Section 3.4 #14 Using <i>The Geometer's Sketchpad</i>® 		<ul style="list-style-type: none"> grid paper ruler protractor computer with dynamic geometry software grid poster paper
3.5 Solving Problems Involving Vectors	57–59	<ul style="list-style-type: none"> BLM G–1 Grid Paper T–2 <i>The Geometer's Sketchpad</i>® 4 BLM 3–3 Chapter 3 Review BLM 3–4 Chapter 3 Practice Test BLM 3–5 Chapter 3 Case Study T3–6 How to Do Section 3.5 #5 Using <i>The Geometer's Sketchpad</i>® 		<ul style="list-style-type: none"> grid paper ruler protractor graphing calculator string, masses, and two hanging-weight scales computer with dynamic geometry software

Chapter 3 Blackline Masters Checklist

	BLM	Title	Purpose
3.1 Vectors			
	G-1	Grid Paper	Student Support
	T-2	<i>The Geometer's Sketchpad</i> ® 4	Technology
	BLM 3-1	Chapter 3 Prerequisite Skills	Practice
	BLM 3-2	Chapter 3 Self-Assessment Checklist	Assessment
	T3-1	How to Do Section 3.1 #10 Using <i>The Geometer's Sketchpad</i> ®	Technology
	T3-2	How to Do Section 3.1 #10 Using TI-83 Plus/TI-84 Plus and TI-Nspire™ CAS	Technology
3.2 Components of Vectors			
	G-1	Grid Paper	Student Support
	T-2	<i>The Geometer's Sketchpad</i> ® 4	Technology
	T3-3	How to Do Section 3.2 #3a) and b) Using <i>The Geometer's Sketchpad</i> ®	Technology
3.3 Adding Vectors			
	G-1	Grid Paper	Student Support
	T-2	<i>The Geometer's Sketchpad</i> ® 4	Student Support
	T3-4	How to Do Section 3.3 #2 Using <i>The Geometer's Sketchpad</i> ®	Technology
3.4 Subtracting Vectors			
	G-1	Grid Paper	Student Support
	T-2	<i>The Geometer's Sketchpad</i> ® 4	Technology
	T3-5	How to Do Section 3.4 #14 Using <i>The Geometer's Sketchpad</i> ®	Technology
3.5 Solving Problems Involving Vectors			
	G-1	Grid Paper	Student Support
	T-2	<i>The Geometer's Sketchpad</i> ® 4	Technology
	BLM 3-3	Chapter 3 Review	Practice
	BLM 3-4	Chapter 3 Practice Test	Practice
	BLM 3-5	Chapter 3 Case Study	Practice
	T3-6	How to Do Section 3.5 #5 Using <i>The Geometer's Sketchpad</i> ®	Technology
	BLM 3-6	Chapter 3 BLM Answers	Answers