Geometry Study Guide

Geometry by Rita Dove

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Introduction

This poem was published in Dove's first complete book of poems, *The Yellow House on the Corner*, in 1980. "Geometry" like other poems in the same volume, explores the dynamic between knowledge and imagination. Through an evolving series of increasingly surprising and fantastic dramatic images, the poem takes the reader on a swift and fanciful excursion from indisputable knowledge ("I prove a theorem") to the realm of imagination. The speaker of the poem seems to be suggesting that the very act of attempting to impose intellectual certainty results in the unleashing of a mysterious, and ultimately wonderful, transformative force. The geometrical "house" immediately "expands" from what is known and certain, and suddenly the speaker is no longer protected, but is "out in the open." The windows, those framed devices through which the speaker observes the external world, "jerk free" and hinge "into butterflies" in a transformation from rational thought to imagination. The poet seems to be saying that where intellect and imagination "intersect" there is "sunlight," or enlightenment, and that, in the end, it is the imagination that is "true and unproven."

Author Biography

Born in 1952 in Akron, Ohio, to well-educated parents, Dove is the daughter of Ray A. Dove, the first African-American chemist to break the racial barrier in the tire and rubber industry, and the former Elvira Elizabeth Hord. An excellent student, Dove was invited to the White House in 1970 as a Presidential Scholar, ranking nationally among the best high school students of the graduating class of that year. She earned a bachelor's degree from Miami University of Ohio in 1973□where she had enrolled as a National Achievement Scholar□and graduated summa cum laude. The following year, Dove studied at West Germany's Tubingen University as a Fulbright scholar. This led to further studies at the Iowa Writers' Workshop. There she met her husband, the German-born writer and journalist Fred Viebahn. In addition to her other achievements, which include fellowships from the National Endowment for the Arts, the Guggenheim Foundation, and the Andrew W. Mellon Foundation, Dove holds the distinction of having been the first African American, as well as the youngest individual, to hold the post of United States Poet Laureate, a position she held from 1993 to 1995. Dove lives with her husband and daughter in Charlottesville, Virginia, where she is professor of English at the University of Virginia Commonwealth.

Poem Text

I prove a theorem and the house expands:
the windows jerk free to hover near the ceiling,
the ceiling floats away with a sigh.

As the walls clear themselves of everything
but transparency, the scent of carnations
leaves with them. I am out in the open

and above the windows have hinged into
butterflies,
sunlight glinting where they've intersected.
They are going to some point true and unproven.

Plot Summary

Line 1

In this first line, Dove sets the stage for the rest of the poem. The speaker asserts indisputable rational knowledge ("I prove a theorem") and immediately a mysterious force is set in motion ("the house expands").

Lines 2-3

In these lines, inanimate objects, which are the product of rational thinking, take on living and even human characteristics: "the windows jerk free to hover near the ceiling," and "the ceiling floats away with a sigh." This attribution of human characteristics to inanimate objects is known as personification.

Lines 4-6

In these lines, the mysterious force that dismantles everything that is known and certain continues. The walls disappear, "the scent of carnations leaves with them," and suddenly the speaker is no longer protected: "I am out in the open." The use of carnations may suggest a celebration of moving from one level of knowledge to another.

Lines 7-9

In the final tercet, the transformation is complete: "above the windows have hinged into butterflies." Windows, rationally constructed frames of perception, have been transformed into living creatures of the imaginative realm, "sunlight glinting where they've intersected." The poet seems to be suggesting that where rational thought and imagination intersect there is enlightenment. These imaginatively transformed creatures "are going to some point true and unproven."

Themes

Order and Disorder

Geometry is the branch of mathematics devoted to understanding physical space in terms of logical theorems. In Rita Dove's poem "Geometry" human beings' ability to understand the world in terms of logic is viewed as a mixed blessing. In the first stanza, the expansion of a house can be taken as a symbol that the intellect has conquered the limitations of the physical world, making what is there bigger and better. The poem's speaker seems to control the dimensions of the house by understanding them. Up to this point, humanity's ability to understand the principles of order that already exist in nature is presented as a marvelous skill because it has not only made the house possible but has also improved beyond its original sense of order, creating this expansion.

By the second stanza, however, the poem raises doubts about the overall worth of geometric order. It shows the things that are lost when there is too much importance placed on logical understanding. The walls "clear themselves," presumably of art works that have been hung on them, which relies on a sense of disorder that has no place in logical theorems. Flowers then lose their scent because their fragrance does not fit into geometric equations. The joys of life are the disorderly and illogical ones, which cannot be appreciated when humans focus strictly on their ability to create order.

In the end, the poem finds a peaceful compromise between order and disorder by observing that the untidy elements that give life pleasure can never be completely deadened by theorems but will always be able to escape them. The windows, made by humans with the help of geometry, have some element to them that makes them as natural and free as butterflies, with the sunlight shining off them in a way that is aesthetically pleasing but not measurable by geometry. The last line refers to "some point true and unproven," expressing the confidence that the natural world has its own order that exists independently of the geometric sense of order.

Beginning and Ending

In a world that thinks that logic is the only really important thing, the proof of a geometric theorem might be considered an end unto itself. The proof may be the start of a different road of scientific inquiry, as scientists and mathematicians apply the information from the theorem to some practical use, but that one particular theorem has been proven, marking an end to a line of inquiry. In this poem, though, Dove presents the proof of the theorem as the beginning of the physical world's independence. Abstract thought, such as geometry, has been seen as confining the essence of nature in the past, but this poem shows that nature's essence can never be captured in a theorem. It is a neverending resource. As many times as humans can create logical models of the physical world, the world has even more mysteries that go beyond all logic. Just when it

might seem that geometry has made the pleasures of art and flowers vanish, as depicted in the poem, the physical world asserts itself again.

In this poem, man-made windows are no more contained by logic than are butterflies. Both have "unproven" qualities about them that go beyond their mathematical qualities, which is why the poem presents them, in the end, as escaping. As Dove presents it, no one logical proof can offer complete understanding of the physical world, but instead it represents the start of a new line of inquiry in the quest for knowledge about reality, which is constantly elusive.

Absurdity

This poem presents a struggle against the constraints of logic. It is a warning that the clearly defined view of the world that is sought by mathematics is too limited, because it only presents a small segment of reality. To make her readers think about reality in ways that go beyond logic, Dove presents them with a sense of reality that is unfamiliar and unexpected. By weaving absurd notions throughout the poem, she is able to counter the human predisposition for logic with the equally strong tendency toward imagination.

Of course, it is absurd to state that a mental act like proving a theorem can cause a physical result like making a room expand, but it is exactly the absurdity of such a statement that forces readers to reconsider the situation being described. Describing a natural and predictable physical reaction would not pique readers' curiosity: when Dove describes things that could not happen, she challenges her readers' assumptions about what they do and do not know. Mathematical equations do not make windows float or walls turn transparent, but the poem does raise the issue of how these imaginary consequences resemble the actual goals of geometric proofs.

Style

"Geometry" is a contemporary American narrative poem. It is like traditional, formalist poetry only in its organization into stanzas. The stanzas are of equal length of three lines each known as tercets; this organization conveys a sense of geometrical symmetry even though three is an uneven number. The poem employs no formal rhyme scheme. It is written in free verse, which means it uses no set pattern of meter, but contains its own unique accents and rhythms. The poet chooses consciously where to break the lines, and does so to produce the sounds that make its ultimate rhythm.

Historical Context

Euclidean Geometry

Most principles of geometry upon which mathematicians base their work today□and for the past twenty-three centuries□are related to the theories and methods first recorded around 300 B.C.E. by the Greek writer Euclid. His comprehensive work on mathematical theory, *The Elements*, was probably heavily based on the work of his predecessor Eudoxus, who had been a student of the philosopher Plato. Euclid refined Eudoxus's theories, along with geometric principles that were the results of generations of mathematicians. His *Elements*, written in Egyptian Alexandria, has been a central influence for twenty-three centuries, from the Hellenistic world after the conquest of Alexander the Great to the Roman Empire, to the Byzantine Empire, the Islamic Empire, into the medieval world and on to today.

The Elements is a comprehensive treatise that brings together geometry, proportion, and number theory, tying them all into one complete theory for the first time. It is divided into thirteen books. The first six are about geometry. At the heart of Euclid's geometry are five postulates. A postulate is a rule that is assumed to be true and does not have to be proved, as opposed to a theorem, which needs proving. Euclid's first three postulates have to do with construction. For instance, the first one states that it is possible to draw a straight line between any two points. The second and third postulates deal with defining straight lines and circles. The fourth postulate states that all right angles are equal. The fifth postulate was to become a challenge to the mathematical community for centuries to come. It states that two lines are parallel if they are intersected by a third one with identical interior angles. This postulate assumed many facts about parallel lines continuing on for infinity. Euclid himself was said to be uncomfortable with the absolute truth of this statement and declared it to be a given truth only after some hesitation. Its acceptance was a factor that defined a set of geometric theories as Euclidean geometry.

Non-Euclidean Geometry

For centuries, mathematicians tried either to prove Euclid's fifth postulate right once and for all or to find the overlooked element that proved it to be wrong. In 1482, the first printed edition translating Euclid's work from Arabic to Latin appeared, stimulating the progress. During the 1600s, various mathematicians rewrote the fifth postulate in ways that helped redefine such concepts as "acute angle" or "parallel" in new ways. By 1767, the French writer Jean Le Rond d'Alembert referred to the problem of parallel lines as "the scandal of elementary geometry."

In the early nineteenth century, there arose various schools of geometry that rewrote the assumptions, creating whole systems of understanding space without having to accept the fifth postulate. Collectively, these schools of thought came to be known as non-

Euclidean geometries. There are two different types of non-Euclidean geometry, each relying on a different understanding of the concept of parallelism. Those that assume that there is no such thing as a "parallel" line that will fail to eventually meet the original one are called "elliptic geometries"; those that assume that there can be multiple lines passing through a point that will par- allel the original line without touching it are referred to as "hyperbolic geometries."

Three mathematicians, working independently of one another, came up with systems of geometry (almost at the same time) in the beginning of the 1800s, all of which left out Euclid's problematic fifth postulate. Carl Frederich Gauss is credited with being the first of them. Gauss disliked controversy and was unwilling to disagree with the prevailing view that Euclid's geometry was the inevitable, indisputable truth, so he devised his system in private and did not publish his findings. In 1823, Gauss read the works of Janos Bolyai, a Rumanian whose non-Euclidean theories were hidden in his introduction to a book by his father, who was also a famous mathematician. Though Bolyai could not have known of Gauss's results, his theories were similar. In 1829, a Russian, Nikolai Lobachevsky, who was himself unfamiliar with the work of Gauss and Bolyai, published his own work of non-Euclidian geometry. These three gave rise to a new way of conceiving of space, changing the assumptions that had been put into place by Euclid more than two thousand years earlier. It is just this sort of advancement of knowledge, of restructuring assumptions that were previously taken to be indisputable truth, that Rita Dove considers in her poem "Geometry."

Critical Overview

Critic Nelson Hathcock, writing *Critical Survey of Poetry* , says that while Dove "can exult in the freedom that imagination makes possible," she also demonstrates in her poems that such imaginative liberty has its costs and dangers. He writes about "Geometry": "Dove parallels the study of points, lines, and planes in space with the work of the poet. . . . Barriers and boundaries disappear in the imagination's manipulation of them, but that manipulation has its methodology or aesthetic." For example, in "Geometry," the voice of the poem tells us: "I prove a theorem." Critic Robert McDowell, writing in *Callaloo* about *Yellow House on the Corner*, praises Dove's "storyteller's instinct," her "powerful images," and "her determination to reveal what is magical in our contemporary lives."

Well-known critic Helen Vendler, in a 1991 article in *Parnassus: Poetry in Review*, says that Dove "looks for a hard, angular surface to her poems," and that "She is an expert in the disjunctive." By this, Vendler means Dove is an expert in disunity or, or that she is very good at expressing an opposition between the meanings of words.

Criticism

- Critical Essay #1
- Critical Essay #2

Critical Essay #1

Kelly is an adjunct professor of creative writing and literature at Oakton Community College and an associate professor of literature and creative writing at College of Lake County and has written extensively for academic publishers. In this essay, Kelly examines reasons why it would be a mistake to include Dove's poem in the tradition of anti-scientific poetry.

It would be very easy for readers to oversimplify the message that can be found in Rita Dove's poem "Geometry," taking the poem to be nothing more than yet another burlesque of humanity's endless fascination with intellectual order. Read lightly, the poem does in fact seem to suggest that the drive to make order out of chaos is a vain and hopeless one that is doomed to failure. It begins with a blunt, triumphant declaration of success, as the speaker announces proof of a theorem. After that, the poem does not portray geometry as any sort of mastery of the world, but instead things go haywire: the house expands, the ceiling fades away, the odors of nature vanish.

These are not the results that are expected to follow proving a theorem, and their illogical nature must be particularly offensive to the mathematician who tried to find some sense of order with the initial proof. Predictability is the point of geometry; when chaos results, it can seem like the poem's speaker, and mathematicians in general, are doomed to fail. This interpretation is supported by a long-standing tradition that the arts have of presenting rational thought as an affront to nature, creating some sort of battle zone between the natural and the rational.

It is one of the most basic questions about being human, and Dove handles it with such sublime grace that readers could easily miss the overall significance of what she says. Philosophers have long divided human essence into two parts, recognizing the distinction between our mammalian bodies that make us part of the physical world even as the purely human capacity to reason separates us from the physical. In recent centuries, poets have tended to side with nature, presenting reason as a form of corruption that alienates humanity from the rest of the natural world. Just because this has been the trend, though, and even though the poem does approach serious thought playfully, still there is not enough evidence for reading "Geometry" as an assault on the weakness of logic.

The ancient Greeks, whose ideas have formed the basis of Western thought, recognized this basic duality in the human condition, representing it in the forms of Apollo, the god of (among other things) light and therefore of logic and truth, and Dionysus, the god of fertility and of wine, whose followers celebrated irrationality. Their concept of humanity's divided essence has come down through time to the present day, when it is still thought that "too much" logic will lead to an orderly but sterile, emotionless existence, whereas the absence of logic leaves one in the realm of animal instinct, at the mercy of unexpected violence and unforeseen occurrences. The Greeks may have worshipped Apollo and Dionysus equally, but the fear of favoring one too heavily over the other has caused supporters to divide rigidly into two camps.

In general, most fields of human endeavor can be seen as drawing on both their intellectual achievement and their physical contact with the natural world. Architects, for instance, cannot design purely theoretical buildings without any recognition of the terrain and the atmospheric conditions that those buildings will be housed in; even physicists, who deal with concepts that are too minute, grand, or old for human experience, find that their theories are pointless if they cannot be supported by some real-world evidence. Geometry is one of the most abstract of cerebral pursuits, with only the thinnest relationship to immediate reality. Poetry was once a field of abstract thought, although it has become increasingly focused on the world's physical nature.

This is, to a large extent, the legacy of the romantic movement that began at the end of the eighteenth century. It followed on the heels of the Enlightenment, when the intellectual world focused on applying scientific methods to understanding human behavior. The French and American Revolutions, for example, were Enlightenment byproducts, and one can see in them the shift from political order based on tradition to political order based on rational principles, such as the rule of the majority. As with most intellectual movements, romanticism is marked by its movement in the direction opposite from the movement that came before□ in this case, from intellectualism to physicality. The romantic response to the Enlightenment was to focus attention on humanity's relationship to nature. If logic is a set of ideas that can be transferred from one situation to another, the romantics turned away from shared knowledge to focus on the subjective experience of the individual writer; if logic is used to find ways to channel water, build bridges, and traverse mountains, romanticism focused on appreciating but not controlling the natural world. The common use of the word "romantic," referring to love within a personal relationship, offers insight into the nature of romanticism; romance emphasizes personal experience and is generally accepted to be beyond of the rules of logic. To apply geometric theorems to romantic love would strike most people as heartless and cynical. In its extreme, romanticism would reject the intrusion of any and all such mental designs.

The age of romanticism has long since faded, but its most enduring legacy is the bond forged between poetry and nature. Poetry is, of course, a cerebral event, built of words, not of flesh or earth. Though some poetry can be instructive or contemplative, most poetry offers straight, unexplained description, or at least relies heavily on the physical evidence that humans know from their five senses. There is a basic distrust, in modern poetry, of ideas that the poet spoon-feeds to the reader, and so poetry instead moves to capture the physical experience with words. Some poets have extended their distrust of theorizing to a deep resentment and suspicion of all logic. From Whitman to Eliot to Neruda, there is a clear path of poets who have been resistant to order, with an assumption that logic and creativity cannot exist at the same time and that one must therefore give way to the other. Since this has been the prevailing trend for the past century or two, it is understandable that readers might assume "Geometry" to be an attack on the insufficiency of words.

In fact, the imagery Dove uses in the poem does lend itself to be interpreted as being antilogical. Though the first stanza presents the proof of a theorem as an uplifting experience, with the windows and ceiling floating up as if all of the weight of the physical

world had been rendered irrelevant, the second is clouded with hints of the theorem's unintended side effects. Walls are cleared of paint, paper, or anything else that may have adorned them; flowers lose their fragrance. The second stanza ends with "I am out in the open." Proving a theorem should provide a sense of completeness, but in this line there is less a sense of liberation than of vulnerability. Readers who see this poem as another example of art rejecting science will focus on the second stanza, with the implication of the danger it carries.

It does not help that the poem's stance toward geometry is not cleared up in the final stanza, which is, if anything, more ambiguous than the previous two. The physical room that the speaker describes *does* experience an uplifting sense of freedom from the same proof that took the walls away. Does this mean that finding the proof is a good thing because it has liberated the physical world (giving manmade windows the independence and beauty of natural butterflies, for example) or that the proof is bad because life is only tolerable in the places that have escaped the deadening confines of geometry? The poem does not explicitly say, but it does have several aspects that should lead readers to accept intellectualism and not treat it, as so many poets have, as the enemy.

One clue is that this final stanza, though open to interpretation in several ways, clearly is meant to evoke a mood of hope and optimism. The dominant images are of sunlight and truth, and the poem does not say that either has suffered from the proving of the theorem. If reality is escaping from geometry here, it isn't being aggressively pursued, indicating that its escape is part of the overall plan. In fact, the final word, "unproven," loops the process back to the opening salvo, "I prove a theorem," indicating that even something as intellectual as a geometric proof is a part of the cycle of nature.

A minor point, but one still worth mentioning, is the poem's structure. It does not follow any strict rhythm or rhyme scheme, but it does have a geometric symmetry, with three stanzas of three lines each. Such a structure could be meant to parody the rigors of geometry, but if this were the case, Dove could have made the case better by using a sing-song pattern to mock the lack of inspiration in formal thought. Instead, the limited use of regular structure implies that order can, in a limited way, be of some good.

It is too simple to say that logic and instinct are mutually exclusive, that the world only has room for nature or rationality, but not both. Obviously, both can come together: The combination of reason with physicality is what defines humanity. Readers who have become accustomed to seeing poets and other writers take sides in this conflict are used to reading the works of extremists, who either warn that humans might become unfeeling machines if mathematical order prevails or that barbaric destruction will rule if mathematical precision is forgotten. Usually, poets tend to favor instinct over reason. It is the self-expressive thing to do. Rita Dove is too intelligent to deal in halftruths, however, and "Geometry," a poem that seems simple and light, refuses to take the easy way out. This poem is too intelligent either to embrace or to reject logic blindly but instead establishes its place in the vast strangeness of the universe.

Source: David Kelly, Critical Essay on "Geometry," in *Poetry for Students*, The Gale Group, 2002.

Critical Essay #2

Ketteler has taught literature and composition. In this essay, Ketteler discusses the way in which Rita Dove makes a comparison between geometry and poetic form.

The poem "Geometry," by Rita Dove, is a poem about ideas and space and the way in which ideas and space represent possibility and liberation. A mathematical science, the discipline of geometry revolves around precision and around measurements that add up to an organic whole to prove a scientific truth. The human mind has the capability to create such precision and order, to make sense of what would otherwise be chaos. By titling the poem "Geometry,"

Dove alerts the reader as to the subject of the poem. Unlike a "riddle poem" (such as Emily Dickinson's "A Narrow Fellow in the Grass"), this poem makes its metaphor explicit□in this case, the comparison of geometry and poetry. The reader then begins reading this poem thinking about the science of geometry and brings with him- or herself ideas about geometry and what it means. Simply defined, geometry is the branch of mathematics that deals with the relations and measurements of lines, angles, surfaces, and solids. Most students study geometry at some point in their schooling and, as part of their learning, have to memorize theorems, proofs, and formulas. Geometry is exact; a measurement is what it is; an angle is what it is□there are no grey areas. Whether the reader likes or dislikes geometry, these are some of the perceptions he or she may bring to this poem upon glancing at the title.

If, by chance, the reader has forgotten his or her high school geometry, the first line brings it all back: "I prove a theorem and the house expands." The word "theorem" is very much associated with geometry, and proving theorems is a main tenet. The speaker immediately takes ownership of the poem, as well as the action of doing geometry. The first line highlights the setting of the poem nicely as well. The reader can imagine a school-age girl, inside of her house, working on her geometry problems. Dove is deliberate in her choice of verbs for the first line. She doesn't equivocate or say "I study" or "I grasp"; instead, she says, "I prove"□ a strong statement. The speaker is clearly both confident and competent in her geometry skills.

The second part of the first line is even more interesting: "the house expands." There is a causal connection; the house expands because the speaker proved a theorem. The house even takes on human characteristics. The last two lines of the first stanza showcase this personification: "the windows jerk free to hover near the ceiling, / the ceiling floats away with a sigh." The mood is one of lightness. The softness of "hover" and "with a sigh" suggests this is a peaceful transformation. The house is expanding beyond its walls. The walls are, in fact, ceasing to exist. And the liberating force is the theorem, which the speaker has proven to be true.

There is a way in which the house in this poem stands in for the mind, especially in the way that it expands. Literary critic Therese Steffen writes in her book *Crossing Color: Transcultural Space and Place in Rita Dove's Poetry, Fiction and Drama*:

Two slightly different readings are imaginable: Either
the house metaphorically portrays the mind, or
the mind-blowing expansion blasts the house apart."
In any case, it is the mental powers at work that cause the shift from solid to soft. What was once a stable structure is drifting apart. In the same way, what was once a stable knowledge base is drifting too□ expanding outwards and upwards.

The reader might think about childhood drawings of a house□very angular, consisting of a box with a triangle roof, a rectangle door and two box windows, usually crisscrossed with a "t." As a physical space, the house is very much a center of geometrical shapes□walls, doors, windows, floors, ceilings, and furniture. But it is also a center of ideas; in other words, of cultural space. Therese Steffen reads the difference between physical space and cultural space in this way: "Cultural space, as distinguished from place and location, is a space that has been seized upon and transmuted by imagination, knowledge, or experience." This is a useful distinction because it helps us separate the metaphorical from the actual. If we speak in literal terms, we know the actual house isn't actually expanding; rather, the cultural space the house represents is expanding□namely the mind of the speaker.

As the poem progresses to the second stanza, the structure of the house continues to destabilize. "As the walls clear themselves of everything / but transparency, the scent of carnations / leaves with them. I am out in the open." That last line of the second stanza is very powerful□why is the speaker "out in the open"? Why has this geometry caused her to lose her grounding? Even sensory perception has faded away with the carnations. Critic Helen Vendler, in her book *The Given and the Made*, reads this as an experience of "pure mentality": "As the windows jerk free and the ceiling floats away, sense experience is suspended; during pure mentality, even the immaterial scent of carnations departs." The speaker is one with her mind□outside forces do not seem to matter. Her surroundings have become "transparent," leaving nowhere to hide. One way to read "openness" is that the speaker's foundation of knowledge has been so altered, the "walls" around her mind so shaken, that all of the limits of imagination and understanding that previously held her back have now vanished. There is great liberation in the transparency because it allows her to see beyond what she previously thought were the limits.

Though some readers may love geometry and see unlimited possibilities in mathematical science, to claim that theorems and geometry problems are inherently beautiful and liberating is still a hard sell for many math-fearing readers. Dove isn't speaking strictly of geometry, though. Just as the house can be read as a metaphor for the mind, geometry itself has a metaphorical quality, especially as it relates to Dove's true love: poetry. Vendler understands the poem "Geometry" in this way:

It is a poem of perfect wonder, showing Dove as a
young girl in her parents' house doing her lessons,
mastering geometry, seeing for the first time the coherence

and beauty of the logical principals of spatial form. The poem 'Geometry' is really about what geometry and poetic form have in common.

Both geometry and poetry concern space. Simply speaking, geometry takes a logical approach and studies the relationship of objects to the space around them. Poetry takes a more fluid, less tangible approach in that it "studies" the inner space of the mind and the mind's relationship to thoughts and ideas. Poetry and geometry are alike in that they both seek truth. Geometry is guided by logical principles: If *x* and *y* are true, then we can make a statement about *z*, and it must be true as well. While this is a mathematical way of thinking, it is also highly poetic. There is poetry in the thought process and in the belief that the truth is important in that it helps us to organize our world and understand our place in it. Theorems are as much about shapes and angles as they are about human beings. The speaker in the poem "Geometry" is swept away by these thoughts and connections, and her world is altered as a result.

The experience of "pure mentality" continues through the third and final stanza. There is a sense of a great transformation in the final lines: "and above the windows have hinged into butterflies, / sunlight glinting where they've intersected. / They are going to some point true and unproven." Butterflies are often symbolic of beauty, wonder, and freedom. Here, the windows have actually transformed into butterflies. Solid materials like wood, brick, and glass have changed into brightly colored, delicate wings. Steffen remarks: "This liberating move from the initial "prove" to the final unproven . . . metamorphoses the wallbound windowframes like earthbound caterpillars into butterflies." The windows of the house, which provide only a limited view on the world, are exchanged for a more expansive view through the eyes of butterflies. They are flying away, as the speaker says, "to some point true and unproven."

The last line of the poem suggests that there is much more still to be discovered. The speaker be- gins the poem by "proving" a theorem. This sets the initial outward movement into action. This new knowledge leaves the speaker left out in the open, without solid walls to shield and limit her. Her entire relationship to the world has shifted by the last stanza. The solid windows have "intersected" with the liberated butterfliesan intersection of an old way of thinking and the new way of thinking and looking at the world. Another way to read the line "sunlight glinting where they've intersected," is to understand it as the intersection of geometry and poetrythe meeting point of mathematical science and emotional introspection. In that intersection is true liberation, which causes the curious, wellrounded mind to continue searching for truth in the world.

This is a poem about poetry and about the beauty of ideas and human thought processes. But it does not exist in a vacuum. Thinking about the larger social implications for this poem enriches the reading of it. The speaker in "Geometry" experiences a liberation brought on by learning something new about herself and the world around her. The saying "knowledge is power" comes to mind. There is great power in the implications of this poem the sense of wonderment increases with each stanza, as boundaries disappear and possibilities loom. By proving the theorem, a

whole new world opens up to the speaker, and it is a world where windows can transform into butterflies.

In short, education is the real stimulus behind the speaker's transformation. And Dove, a highly educated woman, not to mention former poet laureate of the United States, certainly knows the value of education. Much of Dove's poetry speaks to the African-American experience. This poem does not so much speak to that experience as it does to the value of education, which is certainly relevant to the African-American experience. Education is wonderful in that it brings about personal enlightenment, but it is also the way out of poverty and despair. Poetry and abstract ideas about space and people's relationship to the world may seem far removed from the social and cultural realities of everyday working people, particularly poor people who are more concerned with basic needs. However, as the final lines of "Geometry" suggest, there is a key intersection□whether it be the intersection of rational thought and emotion, of thought and action, or of old and new□that can lead to liberation.

Source: Judi Ketteler, Critical Essay on "Geometry," in *Poetry for Students*, The Gale Group, 2002.

Adaptations

Rita Dove, Maya Angelou, and S. E. Hinton are featured on a 1999 video from Films for the Humanities, entitled *Great Woman Writers*.

Journalist Bill Moyers presents an in-depth look at Dove's life and her writings in *Poet Laureate Rita Dove*, a one-hour videocassette produced in 1994 and released by Films for the Humanities. It was originally broadcast on PBS as part of the *Bill Moyers' Journals* series.

Rita Dove was the executive producer for *Shine Up Your Words*, a 1994 television program meant to introduce students to poetry. It is available from Virginia Center for the Book, in Richmond, Virginia.

New Letters magazine produced the radio series *New Letters on the Air*. This series is available on audiocassette, including #305, *Rita Dove*, which features the author reading and discussing her poems in 1985.

Topics for Further Study

Rewrite an existing geometric proof, explaining all of the steps in the proof in your own words.

Dove has said in interviews that poetry is the meeting of words and music. Explore the relationship between music and geometry and explain it in a poem.

Research the ways in which butterflies have changed and relocated in the past thirty or forty years to adapt to the growth of the human population. Report on their fate: Are they becoming extinct or "going to some point true and unproven"?

Of all flowers, Rita Dove chose to note that it was "the scent of carnations" that disappeared when the theorem was proven. What are the associations that people have with carnations? Talk to a florist and then make a chart of the characteristics of carnations that might be ruined by excessive logic.

Find an event that occurs in everyday life that you find mysterious and develop your own theorem to explain it. Try to follow the form of a mathematical proof in your explanation.

Compare and Contrast

1980: The United States Department of Education is developed, comprised of a staff of seventeen thousand full-time employees.

Today: Some people feel that the centralized Department of Education should be disbanded because it cannot adequately understand local issues that affect schools' environments.

1980: A study by UCLA and the American Council on Education finds that college freshmen express more interest in money and power than at any time in the past fifteen years. It is the beginning of a period that came to be known as The "Me" Decade.

Today: After a long period of economic stability in the 1990s, many students take economic stability for granted. Colleges are seeing renewed interest in careers that are not focused on accumulating wealth, such as mathematics and poetry.

1980: Humanity's understanding of the universe expands with the findings of Voyager I, an unmanned space craft that made new discoveries about Saturn's moons as part of its three-year, 1.3 billion-mile journey.

Today: Plans are underway to send two unmanned space crafts to Pluto, the farthest planet in our solar system.

1980: The United States Supreme Court finds, in the case of *Diamond v. Chakrabarty* that a man-made life form□specifically, a microorganism that could eat petroleum in cases of spills□can be patented.

Today: Biotechnology and genetic technology are growing scientific fields and lucrative sectors of the stock market.

What Do I Read Next?

The best poetry of the early part of Dove's career is collected in *Selected Poems*, an anthology of works from *The House on the Yellow Corner*, *Museum*, and *Thomas and Beulah*, which won her the Pulitzer Prize for 1987. *Selected Poems* was published by Pantheon Books in 1993.

Dove is also a novelist. Her book *Through the Ivory Gates*, published by Vintage Books in 1993, tells the fictional tale of a young black artist, whose life is much like the author's, who returns to her home in Akron to run an artistsin- schools program.

W. S. Merwin's poem "The Horizons of Rooms" is similar to "Geometry" in the way that it contemplates the ways that humans surround themselves with logical constructs of their own making, forgetting about the independent world of nature that goes beyond human order. It is found in Merwin's 1988 collection *The Rain in the Trees*, published by Knopf.

Walt Whitman's poem "When I Heard the Learn'd Astronomer" expresses sorrow at the ways that scientific knowledge narrows one's experience of the world. It can be found in *Walt Whitman: The Complete Poems*, edited by Francis Murphy, published by Viking Press in 1990.

Other poems like "Geometry" can be found in *Against Infinity: An Anthology of Contemporary Mathematical Poetry*, initiated, collected, and edited by Ernest Robson and Jet Wimp, published by Primary Press in 1979.

"Ode to Numbers," by the Chilean poet Pablo Neruda, is a short poem that looks at math in the same spirit that informed Dove. It can be found in the anthology *Selected Odes of Pablo Neruda*, translated by Margaret Sayers Peden, published in 1990 by University of California Press.

Linda Pastan's poem "Arithmetic Lesson: Infinity" is included in her collection *Carnival Evenings: New and Selected Poems, 1968-1998*, published in 1998 by W. W. Norton Company.

Further Study

Bachelard, Gaston, *The Poetics of Space*, Beacon Press, 1994.

This renowned modern philosophical text, first published in 1964, explores poetry's relationship to the measurable, physical world.

Dove, Rita, *The Poet's World*, Library of Congress, 1995.

This publication actually consists of the texts of two addresses that Dove made to the Library of Congress while she was poet laureate. Her view of poetry's overall significance and her goals as an individual poet are emphasized.

Mlodinow, Leonard, *Euclid's Window: The Story of Geometry from Parallel Lines to Hyperspace*, Free Press, 2001.

Dove's poem assumes that its reader has a sense of what geometry is about. In this book, Mlodinow traces the history of geometry by discussing the major figures who have shaped modern thought, giving a funny, spry spin to a topic that students can sometimes find dull and dense.

Steffen, Therese, *Crossing Color: Transcultural Space and Place in Rita Doves' Poetry, Fiction and Drama*, Oxford University Press, 2001.

In one of the only books analyzing Dove's overall career, this recent publication looks at the issues of spatial concept that are raised in "Geometry."

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Vendler, Helen, "A Dissonant Triad," in *Parnassus: Poetry in Review*, Vol. 16, No. 2, 1991, pp. 391-404. □, *The Given and the Made: Strategies of Poetic Redefinition*, Harvard University Press, 1995.

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Introduction

Purpose of the Book

The purpose of Poetry for Students (PfS) is to provide readers with a guide to understanding, enjoying, and studying novels by giving them easy access to information about the work. Part of Gale's□For Students□ Literature line, PfS is specifically designed to meet the curricular needs of high school and undergraduate college students and their teachers, as well as the interests of general readers and researchers considering specific novels. While each volume contains entries on □classic□ novels

frequently studied in classrooms, there are also entries containing hard-to-find information on contemporary novels, including works by multicultural, international, and women novelists.

The information covered in each entry includes an introduction to the novel and the novel's author; a plot summary, to help readers unravel and understand the events in a novel; descriptions of important characters, including explanation of a given character's role in the novel as well as discussion about that character's relationship to other characters in the novel; analysis of important themes in the novel; and an explanation of important literary techniques and movements as they are demonstrated in the novel.

In addition to this material, which helps the readers analyze the novel itself, students are also provided with important information on the literary and historical background informing each work. This includes a historical context essay, a box comparing the time or place the novel was written to modern Western culture, a critical overview essay, and excerpts from critical essays on the novel. A unique feature of PfS is a specially commissioned critical essay on each novel, targeted toward the student reader.

To further aid the student in studying and enjoying each novel, information on media adaptations is provided, as well as reading suggestions for works of fiction and nonfiction on similar themes and topics. Classroom aids include ideas for research papers and lists of critical sources that provide additional material on the novel.

Selection Criteria

The titles for each volume of PfS were selected by surveying numerous sources on teaching literature and analyzing course curricula for various school districts. Some of the sources surveyed included: literature anthologies; Reading Lists for College-Bound Students: The Books Most Recommended by America's Top Colleges; textbooks on teaching the novel; a College Board survey of novels commonly studied in high schools; a National Council of Teachers of English (NCTE) survey of novels commonly studied in high schools; the NCTE's Teaching Literature in High School: The Novel;and the Young Adult Library Services Association (YALSA) list of best books for young adults of the past twenty-five years. Input was also solicited from our advisory board, as well as educators from various areas. From these discussions, it was determined that each volume should have a mix of □classic□ novels (those works commonly taught in literature classes) and contemporary novels for which information is often hard to find. Because of the interest in expanding the canon of literature, an emphasis was also placed on including works by international, multicultural, and women authors. Our advisory board members□educational professionals□ helped pare down the list for each volume. If a work was not selected for the present volume, it was often noted as a possibility for a future volume. As always, the editor welcomes suggestions for titles to be included in future volumes.

How Each Entry Is Organized

Each entry, or chapter, in PfS focuses on one novel. Each entry heading lists the full name of the novel, the author's name, and the date of the novel's publication. The following elements are contained in each entry:

- Introduction: a brief overview of the novel which provides information about its first appearance, its literary standing, any controversies surrounding the work, and major conflicts or themes within the work.
- Author Biography: this section includes basic facts about the author's life, and focuses on events and times in the author's life that inspired the novel in question.
- Plot Summary: a factual description of the major events in the novel. Lengthy summaries are broken down with subheads.
- Characters: an alphabetical listing of major characters in the novel. Each character name is followed by a brief to an extensive description of the character's role in the novel, as well as discussion of the character's actions, relationships, and possible motivation. Characters are listed alphabetically by last name. If a character is unnamed□for instance, the narrator in Invisible Man-the character is listed as □The Narrator□ and alphabetized as □Narrator.□ If a character's first name is the only one given, the name will appear alphabetically by that name. □ Variant names are also included for each character. Thus, the full name □Jean Louise Finch□ would head the listing for the narrator of To Kill a Mockingbird, but listed in a separate cross-reference would be the nickname □Scout Finch.□
- Themes: a thorough overview of how the major topics, themes, and issues are addressed within the novel. Each theme discussed appears in a separate subhead, and is easily accessed through the boldface entries in the Subject/Theme Index.
- Style: this section addresses important style elements of the novel, such as setting, point of view, and narration; important literary devices used, such as imagery, foreshadowing, symbolism; and, if applicable, genres to which the work might have belonged, such as Gothicism or Romanticism. Literary terms are explained within the entry, but can also be found in the Glossary.
- Historical Context: This section outlines the social, political, and cultural climate in which the author lived and the novel was created. This section may include descriptions of related historical events, pertinent aspects of daily life in the culture, and the artistic and literary sensibilities of the time in which the work was written. If the novel is a historical work, information regarding the time in which the novel is set is also included. Each section is broken down with helpful subheads.
- Critical Overview: this section provides background on the critical reputation of the novel, including bannings or any other public controversies surrounding the work. For older works, this section includes a history of how the novel was first received and how perceptions of it may have changed over the years; for more recent novels, direct quotes from early reviews may also be included.
- Criticism: an essay commissioned by PfS which specifically deals with the novel and is written specifically for the student audience, as well as excerpts from previously published criticism on the work (if available).

- Sources: an alphabetical list of critical material quoted in the entry, with full bibliographical information.
- Further Reading: an alphabetical list of other critical sources which may prove useful for the student. Includes full bibliographical information and a brief annotation.

In addition, each entry contains the following highlighted sections, set apart from the main text as sidebars:

- Media Adaptations: a list of important film and television adaptations of the novel, including source information. The list also includes stage adaptations, audio recordings, musical adaptations, etc.
- Topics for Further Study: a list of potential study questions or research topics dealing with the novel. This section includes questions related to other disciplines the student may be studying, such as American history, world history, science, math, government, business, geography, economics, psychology, etc.
- Compare and Contrast Box: an □at-a-glance□ comparison of the cultural and historical differences between the author's time and culture and late twentieth century/early twenty-first century Western culture. This box includes pertinent parallels between the major scientific, political, and cultural movements of the time or place the novel was written, the time or place the novel was set (if a historical work), and modern Western culture. Works written after 1990 may not have this box.
- What Do I Read Next?: a list of works that might complement the featured novel or serve as a contrast to it. This includes works by the same author and others, works of fiction and nonfiction, and works from various genres, cultures, and eras.

Other Features

PfS includes □The Informed Dialogue: Interacting with Literature,□ a foreword by Anne Devereaux Jordan, Senior Editor for Teaching and Learning Literature (TALL), and a founder of the Children's Literature Association. This essay provides an enlightening look at how readers interact with literature and how Poetry for Students can help teachers show students how to enrich their own reading experiences.

A Cumulative Author/Title Index lists the authors and titles covered in each volume of the PfS series.

A Cumulative Nationality/Ethnicity Index breaks down the authors and titles covered in each volume of the PfS series by nationality and ethnicity.

A Subject/Theme Index, specific to each volume, provides easy reference for users who may be studying a particular subject or theme rather than a single work. Significant subjects from events to broad themes are included, and the entries pointing to the specific theme discussions in each entry are indicated in boldface.

Each entry has several illustrations, including photos of the author, stills from film adaptations (if available), maps, and/or photos of key historical events.

Citing Poetry for Students

When writing papers, students who quote directly from any volume of Poetry for Students may use the following general forms. These examples are based on MLA style; teachers may request that students adhere to a different style, so the following examples may be adapted as needed. When citing text from PfS that is not attributed to a particular author (i.e., the Themes, Style, Historical Context sections, etc.), the following format should be used in the bibliography section:

□Night.□ Poetry for Students. Ed. Marie Rose Napierkowski. Vol. 4. Detroit: Gale, 1998. 234-35.

When quoting the specially commissioned essay from PfS (usually the first piece under the □Criticism□ subhead), the following format should be used:

Miller, Tyrus. Critical Essay on □Winesburg, Ohio.□ Poetry for Students. Ed. Marie Rose Napierkowski. Vol. 4. Detroit: Gale, 1998. 335-39.

When quoting a journal or newspaper essay that is reprinted in a volume of PfS, the following form may be used:

Malak, Amin. □Margaret Atwood's □The Handmaid's Tale and the Dystopian Tradition,□ Canadian Literature No. 112 (Spring, 1987), 9-16; excerpted and reprinted in Poetry for Students, Vol. 4, ed. Marie Rose Napierkowski (Detroit: Gale, 1998), pp. 133-36.

When quoting material reprinted from a book that appears in a volume of PfS, the following form may be used:

Adams, Timothy Dow. □Richard Wright: □Wearing the Mask,□ in Telling Lies in Modern American Autobiography (University of North Carolina Press, 1990), 69-83; excerpted and reprinted in Novels for Students, Vol. 1, ed. Diane Telgen (Detroit: Gale, 1997), pp. 59-61.

We Welcome Your Suggestions

The editor of Poetry for Students welcomes your comments and ideas. Readers who wish to suggest novels to appear in future volumes, or who have other suggestions, are cordially invited to contact the editor. You may contact the editor via email at: ForStudentsEditors@gale.com. Or write to the editor at:

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