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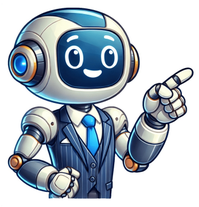

McMurray, R. (1978). Flow Proofs in Geometry.The Mathematics Teacher,71(7), 592-595. Retrieved from to Herbst (2002) in his article entitled Establishing a Custom of Proving in American School Geometry: Evolution of the Two-Column Proof in the Early Twentieth Century, the Two-Column proof was first used in 1913, soon after proofs became a requirement in the geometric curriculum (p. 297).But not everyone can really understand what is going on with the two-column proof, and another format was created the Flow proof.Although it is unclear where the flow proof originate, McMurry (1978) outlines that several statements in a Two-Column proof may confuse students but the flow proof helped to make statements more clear (p. 592).The flow proof is another way to show a direct proof and utilizes bubbles or text boxes and arrows to make its arguments. McMurry (1978) says the flow proof makes it easier for students to use the transitive property (if a=b and a=c, then b=c) because it shows how smaller aspects of a proof are connected instead of students needed to trace back through their arguments (p. 593).One weakness of many geometry students is a failure to use what they have already proved. If students see the implication at the end of each theorem, it may encourage them to be more aware of its availability (McMurry, 1978. p. 593).This format of proof is will yield better results for students and teachers according to McMurry (1978). Students will still need to provide reasons for their statements, but the order isnt as important. Additionally, teachers can show proofs in a clearer manner (p. 595) Want to give your brand videos a cinematic edge? Join our visual experts and special guests for an info-packed hour of insights to elevate your next video project. 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With workflow automation, you can simplify processes, reduce errors, and save time.Learn more scoresvideos May 13, 2025 A flow chart is a powerful visual tool used to illustrate processes, workflows, or systems in a clear and logical manner. By breaking down complex tasks into simpler, step-by-step representations, flow charts enhance understanding and streamline communication across diverse teams or audiences. These diagrams are widely utilized in business, education, engineering, and project management to improve efficiency and clarity. Whether youre mapping out a decision-making process, troubleshooting a problem, or planning a project, Lucidchart templates provide a versatile and professional way to create visually appealing flow charts that save time and improve the presentation of your ideas. Flow Chart Format1. TitleClearly state the purpose or process being represented.2. Start/End SymbolOval shapes signify the beginning and end of the process.3. Process StepsRectangles represent individual steps or actions in the process.4. Decision PointsDiamonds indicate decision-making steps where multiple outcomes are possible.5. ArrowsConnectors show the flow or direction between steps, ensuring logical progression.6. Annotations (Optional)Additional notes or comments can be included for clarity. 40+ Flow Chart TemplatesWord Flowchart Template Free DownloadGoogle DocsMS WordPagesEditable PDFSize: A4, USDownload NowFlow Chart TemplateGoogle DocsMS WordPagesSize: A4, USDownload NowFlow Chart Template WordGoogle DocsMS WordPagesSize: A4, USDownload NowWorkflow Template WordGoogle DocsMS WordPagesSize: A4, USDownload NowMicrosoft Office Flowchart TemplateGoogle DocsMS WordPagesSize: A4, USDownload NowFlowchart PDF DownloadGoogle DocsMS WordPagesEditable PDFSize: A4, USDownload NowDownload Flowchart TemplateMS ExcelMS WordNumbersPagesEditable PDFSize: A4, USDownload NowFlowchart Format In WordGoogle DocsMS WordPagesEditable PDFSize: A4, USDownload NowSimple Flow Chart Template WordGoogle Docs,MS Word,Pages,Editable PDFSize: A4, USDownload NowFlowchartPDFMS WordGoogle DocsApple PagesPDFDownload NowEditable Flowchart TemplateMS WordGoogle DocsApple PagesPDFDownload NowDownload Flow ChartThe web development flow chart sample shows how web templates work to create both static webpages in advance and dynamic webpages on demand. 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You may also check out here Flow Chart in Pages.Free Sample Flow Chart of Harry Potter Church Download NowIn class, if your teacher has assigned you to explain the Harry Potter series on a flowchart, this is the sample you must download. You wouldnt need to make any edits or changes as such, the flowchart is readymade and contains all the necessary information in the way it should. Still, if there is a need for you to tweak it a bit, you can. You may also see Project Flowchart Templates.Free Basic Flow Chart Template in PowerPoint Size: 5.8 KBDownload NowFree Decision Tree Flow Chart Template Size: 20.3 KBDownload NowFree Sample of Process Flow Chart Free Template Size: 38.5 KBDownload NowThis is yet another process-based flowchart examples. Conveniently explain any processfrom beginning till the endusing this standard template. You can insert relevant information in the boxes provided add or subtract shapes, symbols, and arrows based on the requirement.Flowchart Template Excel Size: 16.1 KBDownload NowA flowchart must be easy to follow. Take a look at this flowchart sample. It has got a simple design and layout. Even if youre a beginner and youre dealing with flowcharts for the first-timer, with this general template, it wont be long before you get the grasp of how it is made. You may also see Sales Flow Chart Templates.Free Easy Flow Chart PDF Template Size: 64 KBDownload NowFree Sample Flow Chart Template Size: 8.8 KBDownload NowIf youre looking for more options for the simpler kind of flowcharts, this mockup simple chart belongs to the category. Explain any process as easily as possible using this flowchart sample. It is free, downloadable, customizable, and fully editable. In terms of looks, it is an elegant-looking example. 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There are several ways to design a flowchart like using Communication Flow Chart Templates. However, some people prefer using MS Word. Here is how you can design a flowchart in MS Word.Maximize the page and collapse the ribbons using CTRL+F1 so that you can only see the menu tabs.Select View and click on the option Grid-lines. This will display grids on the page, thus making it easier for you to align the flowchart.Next click on Insert and select shapes. Here you will find specific shapes that are used for flowcharts.Go ahead and select the first shape which will be oblong for Start. Select the shape and your cursor will transform to a plus sign. With the left mouse button pressed, drag the mouse to get the desired shape in the required size.Now click inside the shape and add the label.You can add arrows for the flowchart using the Lines option under Shapes.Go on inserting the desired shapes and arrows to design a perfect flowchart.Types of FlowchartsFlowcharts come in various forms, each tailored to specific needs and applications. Here are the key types of flowcharts:1. Process FlowchartThis is the most common type of flowchart used to map out processes, illustrating steps and decision points for improved understanding and efficiency.2. Data FlowchartUsed in system design and analysis, this flowchart visually represents the flow of data within a system, helping to identify inputs, outputs, and storage points.3. Workflow FlowchartIdeal for project management and team collaboration, this flowchart maps workflows, highlighting roles, responsibilities, and the sequence of tasks.4. Swimlane FlowchartThis type organizes processes into lanes representing different departments or individuals, clarifying roles and improving accountability.5. Decision FlowchartFocused on decision-making processes, this type illustrates different outcomes based on specific choices or conditions.6. System FlowchartCommon in software engineering, it maps out the interactions between system components, helping to understand system architecture and workflows.How to Make a Flowchart in Excel?Using Software Flowchart Templates is a great way to simplify the process of flowchart creation. However, you can also use MS Excel to design flowcharts. Here is how to design a flow Chart in Excel.Open a blank workbook.You need to first design a grid that will help you align the flowchart properly. Select all the cells by clicking on the top left-hand side of the sheet. Now, right-click on any column and specify a column width. This will transform the sheet into uniform grids for the flowchart canvas.Next, click on the Insert tab and select the option SmartArt or Shapes, whatever you prefer.Select the object and then draw it on the sample sheet. You can also add arrows for the flowchart using these.Continue doing this till you have completed the flowchart. You can label each shape by clicking inside it.Designing flowcharts is a great way to define a particular processor to explain the workflow chart to the team and the higher officials. However, people who have to do this day in and day out can surely save a lot of time by using Sports FlowchartTemplates. These can be customized as per their needs and would help them save a lot of time. You can also see more onManagement Flow Charts.How to Create a FlowchartCreating a flowchart involves following a series of structured steps to ensure clarity and effectiveness. Below is a step-by-step guide to help you create a flowchart:1. Identify the PurposeDetermine the specific process or workflow you want to visualize. Clearly define the start and end points to maintain focus and structure.2. Gather InformationCollect all necessary details about the process, including the sequence of tasks, decision points, and participants involved.3. Choose a ToolSelect a tool for creating your flowchart. You can use software like Microsoft PowerPoint, Visio, Lucidchart, or online platforms that provide user-friendly templates.4. Use Standard Flowchart SymbolsIncorporate standard flowchart symbols such as:Ovals for start and end pointsRectangles for process stepsDiamonds for decision pointsArrows to show the flow of steps5. Arrange Steps SequentiallyOrganize the steps logically from start to finish, ensuring each task or decision is clearly represented and connected.6. Add Annotations (Optional)Include brief notes or comments if additional context is needed for specific steps.7. Review and TestExamine the flowchart to ensure it accurately represents the process. Test it with others for feedback and clarity.8. Finalize and SharePolish the flowchart by checking for consistency in design and formatting. Share it with the intended audience or team for implementation.Tips to Remember When Creating a Flowchart1. Keep It SimpleFocus on the key steps and avoid overloading the flowchart with unnecessary details to maintain clarity.2. Use Consistent SymbolsStick to standard flowchart symbols throughout to ensure the diagram is easy to understand.3. Maintain Logical FlowArrange steps sequentially and use arrows to clearly indicate the direction of the process.4. Limit CrossoversMinimize intersecting lines and connectors to keep the flowchart visually clean and organized.5. Add Descriptive LabelsLabel all steps and decision points clearly to provide enough context for understanding at a glance.FAQs Yes, Microsoft Word provides built-in tools to create flowcharts. You can use the Shapes option under the Insert tab to add flowchart symbols and connectors. Yes, Excel offers flowchart templates and tools to create customized flowcharts. You can use pre-designed templates or create one using shapes and connectors under the Insert tab.Oval Represents start or end points.Rectangle Denotes a process or action step.Diamond Indicates a decision point.Arrow Shows the flow or direction.Parallelogram Represents input or output.Circle Used as a connector to link parts of the flowchart.Hexagon Represents preparation or initialization. The Building Blocks of Proofs The theoretical aspect of geometry is composed of definitions, postulates, properties and theorems. They are, in essence, the building blocks of the geometric proof. You will see definitions, postulates, properties and theorems used as primary "justifications" appearing in the "Reasons" column of a two-column proof, the text of a paragraph proof or transformational proof, and the remarks in a flow-proof. A quick review of terms: A definition is a precise description of a word used in geometry. All definitions can be written in "if - then" form (in either direction) constituting an "if and only if" format known as a biconditional. See more about definitions at Precision of Definitions. Example of a definition: An isosceles triangle is a triangle with two congruent sides. ("if - then" form) If a triangle is isosceles, then the triangle has two congruent sides. (reversed "if-then" form) If a triangle has two congruent sides, then the triangle is isosceles. ("if and only if" form) A triangle is isosceles if and only if the triangle has two congruent sides. A postulate is a statement that is assumed to be true without a proof. It is considered to be a statement that is "obviously true". Postulates may be used to prove theorems true. The term "axiom" may also be used to refer to a "background assumption". Example of a postulate: Through any two points in a plane there is exactly one straight line. A theorem is a statement that can be proven to be true based upon postulates and previously proven theorems. A "corollary" is a theorem that is considered to follow from a previous theorem (an off-shoot of the other theorem.) Unlike definitions, theorems may, or may not, be "reversible" when placed in "if - then" form. Example of a theorem: The measures of the angles of a triangle add to 180 degrees. The properties of real numbers help to support these three essential building blocks of a geometric proofs. Example of a property: A quantity may be substituted for its equal. Proofs are an Intellectual Game! A proof is a way to assert that we know a mathematical concept is true. It is a logical argument that establishes the truth of a statement. Lewis Carroll (author of Alice's Adventures in Wonderland and mathematician) once said, "The charm [of mathematics] lies chiefly ... in the absolute certainty of its results; for that is what, beyond all mental treasures, the human intellect craves." Writing a proof can be challenging, exhilarating, rewarding, and at times frustrating. The building of a proof requires critical thinking, logical reasoning, and disciplined organization. Except in the simplest of cases, proofs allow for individual thought and development. Proofs may use different justifications, be prepared in a different order, or take on different forms. Proofs demonstrate one of the true beauties of mathematics in that they remind us that there may be many ways to arrive at the same conclusion. Writing a proof is like playing an intellectual game. You have to decide upon which pieces to use for this puzzle and then assemble them to form a "picture" of the situation. Proofs are fun!! The most common form of proof is a direct proof, where the "prove" is shown to be true directly as a result of other geometrical statements and situations that are true. Direct proofs apply what is called deductive reasoning: the reasoning from proven facts using logically valid steps to arrive at a conclusion. The steps in a proof are built one upon the other. As such, it is important to maintain a chronological order to your presentation of the proof. Like in a game of chess, you must plan ahead so you will know which moves will lead to your victory of proving the statement true. Each statement in your proof must be clearly presented and supported by a definition, postulate, theorem or property. Write your proof so that someone that is not familiar with the problem will easily understand what you are saying. There are several different formats for presenting proofs. It may be the case, that one particular method of presentation may be more conducive to solving a specific problem than another method. The Two - Column Proof Also called the T-Form proof or the Ledger proof. This proof format is a very popular format seen in most high school textbooks. The proof consists of two columns, where the first column contains a numbered chronological list of steps, called Statements, leading to the desired conclusion. The second column contains the justifications, called Reasons, to support each step in the proof. Remember that justifications are definitions, postulates, theorems and/or properties. This format clearly displays each step in your argument and keeps your ideas organized. Statements Reasons 1. 1. Given 2. 2. Midpoint of a segment divides the segment into two congruent segments. 3. 3. Vertical angles are congruent. 4. 4. SAS: If two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, the triangles are congruent. QED This proof format is a more collegiate method. The proof consists of a detailed paragraph explaining the proof process. The paragraph contains steps and supporting justifications which prove the statement true. When prepared properly, the paragraph can be quite lengthy. When using this method, it can be easy to overlook critical steps and/or supporting reasons if you are not careful. Be sure to list your steps in chronological order, and support each step with a definition, theorem postulate and/or property. It is given that C is the midpoint of both in the supplied figure. Since C is the midpoint, we know that because the midpoint of a segment divides the segment into two congruent segments. Knowing vertical angles are congruent, we have . We can now state that by SAS, because if two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, the triangles are congruent. QED The Flow Proof Also called the Flowchart Proof. This proof format shows the structure of a proof using boxes and connecting arrows. The appearance is like a detailed drawing of the proof. The justifications (the definitions, theorems, postulates and properties) are written beside the boxes. The flowchart (schematic) nature of this format resembles the logical development structure often used by computer programmers. This format clearly displays each step in your argument. QED Transformational Proof This proof format describes how the use of rigid transformations (reflections, translations, rotations) can be used to show geometric figures (or parts) to be congruent, or how the use of similarity transformations (reflections, translations, rotations and dilations) can be used to show geometric figures to be similar. The justification in this style of proof will include properties relating to transformations. Be sure you state a sufficient amount of information to thoroughly support your argument. Since transformational proofs are presented in a paragraph format, be sure to organize your ideas in chronological order, and support each idea with a definition, theorem postulate and/or property. We will be highlighting the "ideas" throughout the proof with a "bullet" to make reading the proof easier. Not all situations will be easily solved by a transformational proof. The basis of this transformational proof will be a rotation of 180 about C. A rotation of 180 about C will map A onto and map B onto since we are dealing with straight segments. because these are the same angle since they have the same sides (rays) and the same vertex. because A'CB' is a 180 rotation of ACB about E, and rotations are rigid transformations which preserve angle measure. by the transitive property of congruence (or substitution). because a midpoint divides the segment into two congruent segments. because a rigid transformation preserves length. by SAS. QED Ending a Proof - QED A traditional method to signify the end of a proof is to include the letters Q.E.D. These letters are an acronym for the Latin expression "quod erat demonstrandum", which means "that which was to be demonstrated". When a proof is finished, it is time to celebrate your hard work. Stamp your proof with a QED! NOTE: The re-posting of materials (in part or whole) from this site to the Internet is copyright violation and is not considered "fair use" for educators. Please read the "Terms of Use". In order to continue enjoying our site, we ask that you confirm your identity as a human. Thank you very much for your cooperation. Code of Conduct GeneratorCompany Profile GeneratorCustomer Profile GeneratorJob Description GeneratorMeeting Minutes GeneratorOut of Office Message GeneratorPower of Attorney GeneratorProduct Requirements Document GeneratorRelease of Liability Generatorscoresvideos In this article, youll find free, downloadable workflow templates in Microsoft Excel, Word, and PDF formats. Document and streamline each unique business process with a visual flowchart to ensure continuity and efficiency for even the most detail-heavy projects. Download Project Management Workflow TemplateExcel | Word | PDF Align your project strategies, track project progress, and streamline each step in your project with this free, downloadable template. 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Workflow templates showcase a graphic illustration of sequential steps, making understanding, following, and analyzing the steps easier and more effective for the end user. Additionally, workflow templates describe the order in which steps must be completed in a visually satisfying manner, determining specific activities in a structured, easy-to-follow format. You can easily identify and make changes within a process to render even the most common business situations more efficient. Workflow templates communicate how to handle and carry out a process or project, and the visual flowchart or diagram, providing a structured format, helps to make the process even easier to follow. Capture, visualize, and build process requirements unique to each business process and vertical, from project management to healthcare and even construction. Customize your workflow template with columns, headings, metrics, and data that you have to track or include, and document targeted rules for a workflow, including approval, order of approval, and the steps that ensue after an approval. A workflow template can seem cumbersome and unnecessary in a business process, as it outlines and details even the simplest of tasks. However, workflow templates are an extremely helpful resource in identifying key details, including the following: Appropriate team members for each process Areas for improvement or a process that could increase efficiency Data collection or monitoring Approval processes and key stakeholders who provide approval Additionally, workflow templates can make even the most complex, detailed processes more understandable, clear, and concise this helps to not overwhelm anyone learning or carrying out a detailed process. Workflow templates can also help businesses and their team members do the following: Easily show the flow between steps. Define, analyze, and discuss any part of the process. Standardize a process, and find and identify any gaps in the process. Identify and eliminate any processes that are not adding value to the business. Facilitate communication and teamwork among team members. Keep everyone on the same page about a process and its ensuing processes. Provide a clear understanding of a process, why its carried out, and the business value of the process. People tend to veer away from using workflows for a variety of reasons. They may be hesitant to disrupt an already-existing process, want to maintain complete control over a process and try things themselves, or want to construct their own unique process that doesnt follow a preformatted structure. However, workflow templates help to provide consistency and efficiency for all unique processes, increasing overall control and effectiveness of processes as they are carried out by other team members. Workflow diagrams can help businesses who employ them in several ways for instance, by creating an efficient approval process, assigning resources and participants to specific parts of the process, postponing or restarting workflow activities with ease, and designing workflow conditions or specifications. In addition to the aforementioned benefits, workflow diagrams offer the following capabilities: Specify the frequency of tasks and the ideal amount of time it should take to complete each task. Include task instructions for each process or an individual step in the process. Initiate the workflow after preceding steps, either automatically or manually. Send documents to key stakeholders for approval after step or process completion, and create one-time reviews for time efficiency. Set approval status and ensure steps are carried out only after approval is granted. Pause or stop the workflow at a specific step, or until a specified date. Set the workflow status and send updates to any involved resources. Update steps directly within the workflow to increase efficiency. As you begin creating your own workflow diagram for your unique business process, consider the purpose for diagramming your workflow, whether to streamline a process or make a process less confusing overall. Make sure you understand the entire process, from start to finish, and identify the basic steps of the process to ensure that those are highlighted and included within the diagram. Document clear start and end points for the process, and, as you progress, draft the steps that occur in between these two points of the process. Look for alternate ways to complete each process, and make sure to note each exception within the diagram. Doing this will give you and your team members the flexibility to customize the workflow as it progresses, as pointing out exceptions will force you to keep only the most efficient steps of each process. Microsoft Word offers a variety of free workflow templates that you can use to design and format your own workflow template. Follow the steps below to achieve the best results: Open Microsoft Word. In the window, select the Lightbulb icon at the top of the page, and search for Workflows. Choose the related link that comes up under the Workflows search. Select a workflow template that suits your needs, and click OK. Create and fill out the workflow template based on your unique business process by editing or adding workflow steps. Microsoft Excel has preformatted workflow templates within its platform, which you can download and customize for your needs. To access these templates, follow these steps: Open Microsoft Excel. Using the search bar at the top of the Excel workbook, search for Workflow Templates. In the Flowcharts Template Workbook, you will find a variety of existing workflow templates. Select the one appropriate for your business needs, and click Create to open the worksheet. Create and fill out the workflow template based on your unique business process by editing or adding workflow steps. Microsoft PowerPoint offers a unique capability called SmartArt that allows users to insert premade flowcharts directly into a PowerPoint slide. To access this feature, follow these sequential steps: Open Microsoft PowerPoint. Select the Insert tab at the top of the screen in the Illustrations Group, and select SmartArt. In the SmartArt Gallery, click the Process tab. Here, you will find a large quantity of flowchart templates. Select the SmartArt process template that suits you, and insert it into the PowerPoint. Edit the template for your process. You can insert both text and pictures within the template to efficiently explain and represent you process as needed. Visio offers every from basic to detailed workflow templates that outline business process with shapes, images, and text. Follow these steps to learn how to build the most effective Visio template for your business: Open Visio and select the Flowchart category, and select Basic Flowchart. For each step in your process, select and drag a new flowchart shape into your template. Connect flowchart shapes by simply holding your mouse over the first shape, selecting the arrow that pops up after a few seconds, and dragging it over to the shape you want to connect it to. Select any shape and click inside of it to add text to it to include additional information not evident from the shapes alone. Continue to add shapes and text to the template until your business process is completely explained via the visual Visio workflow template. Empower your people to go above and beyond with a flexible platform designed to match the needs of your team and adapt as those needs change. The Smartsheet platform makes it easy to plan, capture, manage, and report on work from anywhere, helping your team be more effective and get more done. Report on key metrics and get real-time visibility into work as it happens with roll-up reports, dashboards, and automated workflows built to keep your team connected and informed. When teams have clarity into the work getting done, theres no telling how much more they can accomplish in the same amount of time.Try Smartsheet for free, today. Try Smartsheet for Free Get a Free Smartsheet Demo High School Math based on the topics required for the Regents Exam conducted by NYSED.Flowchart ProofsFlowchart proofs are organized with boxes and arrows; each statement is inside the box and each reason is underneath each box. Each statement in a proof allows another subsequent statement to be made. In flowchart proofs, this progression is shown through arrows. Flowchart proofs are useful because it allows the reader to see how each statement leads to the conclusion.Proving two triangles are similar using a flow chart proof Triangle Congruence Proofs using Flow Charts Try out our new and fun Fraction Concoction Game.Add and subtract fractions to make exciting fraction concoctions following a recipe.There are four levels of difficulty: Easy, medium, hard and insane. Practice the basicsof fraction addition and subtraction or challenge yourself with the insane level. We welcome your feedback, comments and questions about this site or page. Please submit your feedback or enquiries via our Feedback page. Share copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. 25992 Students Helped in Math Numerade has a great goal - to increase people's educational levels all around the world. Educators do not complete student's personal homework tasks. We create video tutorials that may be used for many years in the future. Dr. Mei Lin Chen PhD in Math Solving an algebraic equation is like doing an algebraic proof. Algebraic proofs use algebraic properties, such as the properties of equality and the distributive property.Basic Algebraic Properties Reflexive Property of Equality Symmetric Property of Equality Transitive Property of Equality a = b and b = c, than a = c Substitution Property of Equality If a = b, then b can be used in place of a and vice versa Addition Property of Equality If a = b, then a + c = b + c Subtraction Property of Equality If a = b, then a - c = b - c Multiplication Property of Equality Division Property of Equality If a = b, then a c = b c Although we may not write out the logical justification for each step in our work, there is an algebraic property that justifies each step. Example: Subtraction Property of Equality Symmetric Property of Equality. Since segment lengths and angle measures are real numbers, the following properties of equality are true for segment lengths and angle measures:Automate workflows for every department from finance to operations, marketing, and more with a robust platform thats easy to use and scale. Establish structured, efficient, and enforceable workflows using forms, notifications, task sequences, and business rules within a secure low-code environment. Much of geometry is about working backwards in order to solve problems. Unlike other types of math, in geometry youre often given the answer to a problem and asked to demonstrate how its true. In order to do this, you must utilize geometric proofs.Geometric proofs are a list of Statements and Reasons used to prove that a given mathematical concept or idea is true.Statements are claims about a geometric problem that cannot be proven true until backed by a mathematical Reason.Reasons are pieces of evidence that support a Statement.Today we will demonstrate how to write a proof using columns, boxes, and paragraphs. Each method provides a different way to list the steps and show why each Statement is true. So here is a breakdown of three of the most useful geometric proofs, how and when to use them, and why knowing them will make geometry so much easier!Two-Column ProofsTwo-column proofs are a type of geometric proof made up of two columns. The first has a list of Statements. The second has a list of Reasons that correlate to each Statement.This picture shows angles A, B, and C.Its given that C and A are complementary, meaning that when you add them together they equal 90. Its also given that B and C are complementary.Now we must prove that angles A and B are equal.StatementsReasonsA and C are complementary, B and C are complementaryGivenA + C = 90, B + C = 90Definition of Complementary AnglesTransitive PropertySubtraction PropertyDefinition of Congruent AnglesThe first step is filling in the information weve already been given. Next, we write down what steps we can take using Definitions and Properties to prove that A B. In orderWhen you look at the problem its intuitive to assume that angle A is congruent to angle B, but we dont know why theyre congruent. So in order to prove it, we fill the Reasons column with a series of Justifications. Justifications can be geometric definitions, postulates (commonly accepted concepts based on mathematical reasoning), properties (a characteristic that applies to a given set of numbers), or theorems (rules that are demonstrated using formulas). To logically arrive at the conclusion that angle A is congruent to angle B, each step in the Statement column needs to be broken down into an algebra problem. We then need to find a Justification that proves each of these problems true. Review definitions, postulates, properties, and theorems to find Justifications that relate to each of your Statements.Two-column proofs present each step in an organized and concise manner. By combining both visual and written elements of geometry, youre able to see and conceptualize why each written step is true. Because two column proofs are so easy to understand, high school teachers often use this proof as a way of introducing students to new geometric concepts.Paragraph ProofsParagraph proofs are detailed paragraphs that explain the entire process of proving each Statement. Just like two-column proofs, they consist of multiple steps and each step contains a Statement and a Justification. But instead of listing steps in columns, all the information is written out as a paragraph.Paragraph proofs need to be written so that each step supports the next. Each Statement and its corresponding definition, theorem, property, or postulate needs to build off the previous one. Because paragraph proofs are so wordy, it can be hard for geometry beginners to understand them. Thats why this type of proof is more commonly used at the collegiate level of geometry.Using what we know about Paragraph Proofs, lets evaluate the problem belowSince WXY is a right angle, WXY=90 by the definition of a right angle. By the Angle Addition Postulate, WXY=2 + 3. By substitution, 2 + 3=90. Since 1 3, 1 = 3 by the definition of congruent angles. Using substitution, 2 + 1=90. Thus by the definition of complementary angles, 1 and 2 are complementary.Like in two-column proofs, the first sentence in a paragraph proof is restating what we already know. We then write out a logical order of Statements and their Reasons to prove that 1 and 2 are complementary.Flowchart ProofFlowchart proofs are a type of geometric proof that uses boxes and arrows to connect each Statement. Each Statement is written inside a box with its correlated Justification listed underneath.Unlike paragraph proofs, when using the flowchart method you dont have to write out each step and Justification in a sentence. Instead, you can present each Statement and Justification with boxes and use arrows to depict how the steps are related to each other.Given: Parallelogram ABCDProve: AE EC and ED BEIn the above picture, the definition of a parallelogram, alternate angles theorem, and properties of parallelograms are used as Justifications for the listed Statements.Flowchart proofs show the progression of each Statement using arrows rather than words. This makes it easy to show how each idea is related to the next without having to write it out. This method is self-explanatory and is a good tool for introducing beginning geometry students to new definitions, theorems, properties, and postulates.Best Practices for Geometric ProofsTwo-column, paragraph, and flowchart proofs are three of the most prevalent proofs used in geometry. Each presents the steps and the Statement-and-Justification pairs in different ways. The logic will be the same no matter what form the proof takes, so its more important to educate yourself on the different definitions, theorems, properties, and postulates of geometry. This way, youll be able to come up with the proper Justification for each Statement.Here are some commonly used Justifications:Name of Postulate, Definition, Property, or TheoremExplanationDefinition of Congruent AnglesTwo segments are congruent if and only if they have the same lengthDefinition of ComplementaryTwo angles are complementary if and only if their sum is 90 degrees. Angles that create a right angle are complementary.Addition Property of EqualityYou can add the same thing to both sides of an equationSubtraction Property of EqualityYou can subtract the same thing from both sides of an equationMidpoint TheoremIf B is the midp