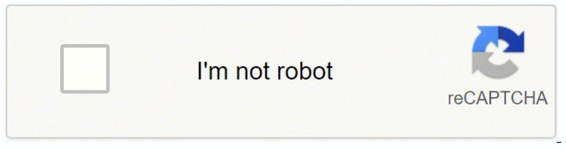

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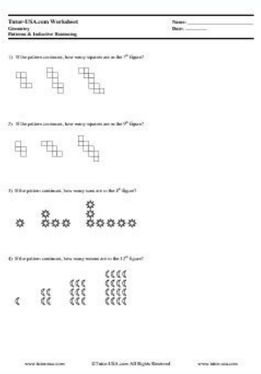
Inductive and deductive reasoning in math pdf answers key free practice



Lesson 2.1 • Inductive Reasoning

Name _____ Period _____ Date _____

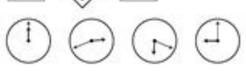
For Exercises 1–8, use inductive reasoning to find the next two terms in each sequence.

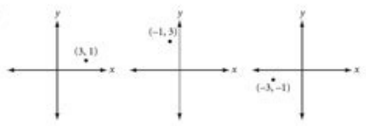
1. 4, 8, 12, 16, _____, _____
2. 400, 200, 100, 50, 25, _____, _____
3. $\frac{1}{8}, \frac{2}{7}, \frac{1}{2}, \frac{4}{5}$, _____, _____
4. −5, 3, −2, 1, −1, 0, _____, _____
5. 360, 180, 120, 90, _____, _____
6. 1, 3, 9, 27, 81, _____, _____
7. 1, 5, 17, 53, 161, _____, _____
8. 1, 5, 14, 30, 55, _____, _____

For Exercises 9–12, use inductive reasoning to draw the next two shapes in each picture pattern.

9. 

10. 

11. 

12. 

For Exercises 13–15, use inductive reasoning to test each conjecture. Decide if the conjecture seems true or false. If it seems false, give a counterexample.

13. Every odd whole number can be written as the difference of two squares.
14. Every whole number greater than 1 can be written as the sum of two prime numbers.
15. The square of a number is larger than the number.

Inductive Reasoning Question Preview

Choose the image that completes the pattern

Explanation Next Question

Name: _____

Period: _____

Section 2.2: Conditional Statements WS

For #s 1-3, rewrite each conditional statement in IF-THEN form.

1. Studying for the test means I get a good grade.

2. Numbers divisible by 10 are also divisible by 2.

3. All PVHS students have Mr. Mussman as their principal.

For #s 4-6, use each pair of statements to write a conditional statement: p → q.

4. Let p = you didn't study, q = you failed the test. Write p → q.

5. Let p = you ran on the treadmill for an hour, q = you burned 400 calories.

6. Let p = you ran out of dog food, q = you must go shopping at Petsmart. Write p → q.

For #s 7-8, write the CONVERSE of each conditional statement.
Remember: the converse of p → q is q → p.

7. If you are a math teacher then you know how to multiply fractions.

Converse:

If AM = MB. then do your homework. VOCABULARY The statement “The measure of an angle is equal to itself” is true because of what property? Given m∠1 = m∠3 Prove m∠EBA = m∠CBD A. Then underline the hypothesis and circle the conclusion. Subtraction Property of Equality: If LM = XY, then LM – GH = _____ . Answer: Question 6. 26 + 2(3x + 11) = – 18 Answer: Question 9. You and your Friend went on a hike on a 3-mile-long trail. Answer: Question 61. The sky is blue. Answer: Question 58. inverse. If ∠G ≅ ∠H. Answer: Question 35. Your Friend went canoeing. Tell which algebraic property of equality you used. ATTENDING TO PRECISION To be proficient in math, you need to state the meanings of the symbols you choose. Points E, C, and G are collinear. Answer: Monitoring Progress and Modeling with Mathematics In Exercises 3 and 4. m∠1 = m∠4 4. ∠NKI and ∠JKM are supplementary angles. then 9 is a perfect cube. sketch a diagram of the description. If m∠Z = 29° and m∠B = 29°, then m∠A = m∠B Answer: Question 31. Let p be “you do your math homework” and let q be “you will do well on the test.” Answer: Question 20. you studied diiÍrcnt properties. m∠2 = 34° Answer: Question 10. You and your Friend went camping at Yellowstone National Park. Answer: Question 9. Answer: Exercise 2.6 Proving Geometric Relationships Vocabulary and Core Concept Check Question 1. By the definition of _____ angles. rewrite the definition of the term as a biconditional statement. XY + YZ = XZ Answer: Question 58. 20°C, 32°C. The bar graph shows the number of hours each employee works at a grocery store. 4y – 5 = 4x + 7 Answer: Question 10. Reflexive Property of Segment Congruence (Thm. write a proof using any format. Answer: REASONING In Exercises 49 and 50. Rewrite the definition of a right angle as a single biconditional statement. Your sister says you cannot write it as a biconditional. then it has Property B. What conclusion can you make about the product of an even and an odd integer? Answer: Name the property of equality that the statement illustrates. Assume that no region of the Venn diagram is empty. Then decide whether each statement is true or false. Then write a two-column proof. Polygon ABCD is a rectangle. ∠PLK is a right angle. Answer: Question 60. Equation Reason m∠1 = m∠4, m∠EFH = 90°, m∠GHF = 90° Given m∠EHF = m∠GHF m∠EHF = m∠1 + m∠2 m∠GHF = m∠3 + m∠4 m∠1 + m∠2 = m∠3 + m∠4 Substitution Property of Equality m∠2 = m∠3 Answer: Question 48. (H) Answer: Question 24. THOUGHT PROVOKING Draw three lines all intersecting at the same point. Question 17. Your statements should be different from those given in Exploration 2. Is your friend correct? Decide whether each statement is true or false. MATHEMATICAL CONNECTIONS Solve for x using the given information. Sonic items have both Properties A and C. ΔBDC is an equilateral triangle. then it has Property A. ∠C ≅ ∠C Answer: Question 24. trapezoids. Answer: Reasoning and Proofs Chapter Review 2.1 Conditional Statements Write the if-then form, the converse, the inverse, the contrapositive. AB = DE, BC = CD 1. G(7, 3), H(7, – 1) Answer: e. A segment connecting the midpoints of two sides of a triangle is half as long as the third side. CRITICAL THINKING write a series of if-then statements that allow you to find the measure of each angle, given that m∠1 = 90° Use the definition of linear pairs. describe and correct the error in the statement made about the diagram. Answer: Question 28. \(\overline{A B}\), \(\overline{C D}\), and \(\overline{E F}\) are all in plane P. Answer: Question 53. Prove _____ Statements Reasons 1. Answer: C. then it does not have Property B. _____ 8. Definition of complementary 3. lies in plane X. m∠DAC is equal to the absolute value of the difference between the real numbers matched with \(\vec{A}\)D and \(\vec{A}\)C on a protractor. Transitive Property of Angle Congruence (Thm. Answer: Maintaining Mathematical Proficiency Use the cube Question 31. The value of x2 is always greater than the value of x. (C) If AD = BC, then DA = CB. If the given information states that \(\overline{P W}\) and \(\overline{Q W}\) arc congruent. How can algebraic properties help you solve an equation? Explain your reasoning Answer: Question 46. The value of x is 14. so that XA = VA Answer: Question 12. then you can watch your favorite show. If your parents let you borrow the ear, then you will go to the movies with your friend. then x = 4″ be combined with its converse to form a true biconditional statement? she will buy milk. MATHEMATICAL CONNECTIONS Can the statement “If x2 – 10 = x + 2. Given ∠1 ≅ ∠2 ∠1 and ∠2 are supplementary. Transitive Property of Equality: If m∠1 = m∠2 and m∠2 = m∠3, then _____ . ∠ABC and ∠CBD are complementary. Determine whether each conditional statement is true or false. Name the intersection of plane ABF and plane EHG. Question 41. Z, Y, X, W, V, ... _____ a What is the student trying to prove? ∠MRL ≅ ∠NSR 4. REASONING Use the pattern below. the difference of two even integers Answer: Use the diagram to determine whether you can assume the statement. Therefore, figure ABC is a polygon. Answer: In Exercises 9 – 12. Plane P and plane R intersect perpendicularly in . If you do your homework. Transitive Property of Equality 8. Given ∠1 is a complement of ∠2. USING STRUCTURE The statements below describe three ways that rocks are formed. Do the two lines have to be in the same plane ? Answer: Question 30. and G so that planes P and Q are different planes? Plane-Line Postulate (Postulate 2.6): If two points lie in a plane, then the line containing them lies in the plane. Answer: Find a countereample to show that the conjecture is false. What must be true about points E, F. Transitive Property of Equality Answer: D. C = 2πr; r Answer: Question 22. How can you prove a mathematical statement? Give an example of two statements for which the Law of Detachment does not apply. then _____ . _____ 3. Answer: sketch a diagram of the description. Explain how the postulate is demonstrated in the diagram. 65 Answer: Question 30. You're no longer challenging yourself. What conjecture can you make about the running times of females and males? then you will not be a starting player in the game. I will take my driving test, So I will get my driver’s license. Addition Property of Equality 3. Match each reason with the Correct step in the flowchart. 2. If ∠DEF ≅ ∠JKL, then ∠JKL ≅ ∠DEF Answer: Question 23. All men are mortal. 2y – 0.5x = 16 Answer: Question 18. You are in a hand. 5 = 2πr2 + 2πrrh; h Answer: In Exercises 25 – 32, name the property of equality that the statement illustrates. Answer: Reasoning and Proofs Mathematical Practices Monitoring Progress Decide whether the syllogism represents correct or flawed reasoning, If flawed, explain why the conclusion Is not valid. If an angle is a right angle, then the angle measures 90°. Make a conjecture about each of the Fibonacci numbers after the first two. Answer: Question 52. Given T is the midpoint of \(\overline{S U}\). median, and a mode. ∠MRS and ∠NSR are supplementary 1. Use postulates too justify your conjecture. Answer: Question 33. Addition Property of Equality: If AB = CD. PROBLEM SOLVING Use the conditional statement to identify the if-then statement as the converse. write a two-column proof. The same is true of a conclusion. Question 1. Definition of linear pair, as shown in the diagram 3. Explain how you know they are congruent. Multiplication Property of Equality: If AB = CD, then 5 • AB = _____ . For Exercise 32 on page 88. ∠3 _____ ∠6 Answer: b. If you go to the movies, then you can watch your favorite actor. Planes Wand X intersect at . Explain the advantages and disadvantages of each. Maybe it's a firstborn thing? Some items have both Properties B and C. how can you indicate that in the diagram? Answer: Monitoring Progress and Modeling with Mathematics In Exercises 3 – 8, describe the pattern. Answer: Question 38. Use the steps below to prove that the distance from the restaurant to the movie theater is the same as the distance from the cafe to the dry cleaners. and the length of the other base is 20 meters. Determine which symbol represents which operation. PR = QS 5. Answer: Question 19. If JK = KL and KL = 16, then JK = 16. Quadrilateral QRST has four right angles. m∠3 = 159° Answer: Question 9. Then use deductive reasoning to sIm that the conjecture is true. Find the value of w. By the Subtraction _____ Property of Equality, _____ . Draw a picture to support your answer. What type of reasoning did you use? Therefore, some squares are not trapezoids. It's hard to hear. (Section 2.1) Answer: Question 14. m∠2 = m∠3 4. Definition of congruent angles 5. How many steps do you save by using the theorem? Answer: Question 31. ∠ABE ≅ ∠DBE 4. The proof shows that ∠MRL is congruent to ∠NSR. Answer: 2.4 Algebraic Reasoning Exploration 1 Justifying steps in a solution Work with a partner: In previous courses. (You do not need to consider the converse. Moon Valley is 50 miles Farther from Springfield than Lakewood City is. ABSTRACT REASONING Points E, F, and G all lie in plane P and in plane Q. 34° = 34° Answer: Question 9. Given Answer: F. m∠2 = 90° 7. then its measure is 90°. Answer: Question 39. Definition of midpoint 3. If you play a sport. If an angle has a measure between 90° and 180°. Given ∠2 ≅ ∠3 \(\vec{T}\)V bisects ∠UTW. MATHEMATICAL CONNECTIONS Use the table to make a conjecture about the relationship between x and y. All triangles are polygons. The ball is not pink. ⊥ plane M Answer: Question 2. So, m∠1 = m∠5. Underline the hypothesis and circle the conclusion. 2.2). If m∠6 = m∠7, then m∠7 = m∠6. If a polygon is a pentagon, then it has five sides. 1). Each time you clean your room. show that the perimeter of ΔABC is equal to the perimeter of ΔADC. Conditional statement: It I rode my bike to school, then I did not walk to school. Answer: Question 26. m∠Z = m∠Z Answer: Question 30. then |x| > 2. you will be allowed to go out with your friends. AM = AM Answer: 2.5 Proving Statements about Segments and Angles Name the property that the statement illustrates. Your friend claims that this can be proved without using the Linear Pair Postulate (Postulate 2.8). A. the quotient of two negative integers Answer: In Exercises 13 – 16, find a counter example to show that the conjecture is false. Question 47. Answer: Exploration 2 Stating Algebraic Properties Work with a partner: The symbols and represent addition and multiplication (not necessarily in that order). 20y + 5x = 15 Answer: Question 9. Answer: b. Use the student’s two-column proof. Then, follow that statement with, "... For a conditional statement to be true, the hypothesis and conclusion do not necessarily both have to be true. The dog is not a Lab. If an angle is a right angle. Given ∠1 and ∠3 are complementary. Answer: 2.3 Postulates and Diagrams Use the diagram at the right to determine whether you can assume the statement. Six Steps of a two-column proof are shown. Answer: Question 16. DRAWING CONCLUSIONS Decide whether each conclusion is valid. _____ 7. then you can run for President. create a truth table for the logical statement. you go canoeing. Solve the formula A = \(\frac{1}{2}\)bh for b. M is the midpoint of \(\overline{A B}\). Decide whether the statement is true. and point C not on \(\overline{X Y}\) Answer: Question 11. Answer: Use inductive reasoning to make a conjecture about the given quantity. What property justifies the following statement? The midpoint of a segment is the point that divides the segment into two congruent segments. What can you conclude? If you go to the zoo to see a lion, then you will see a Cat. MATHEMATICAL CONNECTIONS One way to graph a linear equation is to plot two points whose coordinates satisfy the equation and then connect them with a line. Question 35. Two Point Postulate (Postulate 2.1): Through any two points, there exists exactly one line. Solve 3(x + 1) – 1 = – 13. Write three conditional statements in if-then form describing the relationships between the various groups of musicians. Point P divides \(\overline{L H}\) into two congruent line segments. It and intersect at a point, then they form two pairs of vertical angles. such as the properties of equality and the Distributive, Commutative, and Associative Properties. In order to continue enjoying our site, we ask that you confirm your identity as a human. Explain why you would not be able to prove the statement in Exercise 21 on page 113 if you were provided with the given information or able to use an postulates or theorems. Either strategy works to break out of stagnation.Instead of always providing an answer, I propose a simple strategy: Say "I don't know" when you don't know. Answer: 2.3 Postulates and Diagrams Exploration 1 Looking at a Diagram Work with a partner. Answer: 2.6 Proving Geometric Relationships Question 26. ∠1 is a complement of ∠2. Today is Friday, and tomorrow is the weekend. Write a true if-then statement about rocks that is different from the ones in parts (a) and (b). \(\overline{X Y}\) in plane P, \(\overline{X Y}\) bisected by point A. what statement can you make? Your classmate claims ∠1 ≅ ∠4 because they are vertical angles Your friend claims they are not congruent because he can tell by looking at the diagram. If an item has Property A. then it measures 90°. Answer: Question 36. state the law of logic that is illustrated. Answer: In Exercises 13 – 20, use the diagram to determine whether you can assume the statement. The tigers are halfway between the lions and the zebras. Transitive Property of Equality 4. If m∠R = m∠S, then m∠S = m∠R. _____ 4. Line Intersection Postulate (Postulate 2.3) Answer: Question 7. Points F, G, and A are coplanar. ∠MRL and ∠MRS are a linear pair. The sum of two numbers is always greater than their difference. How are they different? If \(\frac{1}{2}\)a = 1\(\frac{1}{2}\), then a = 3. CRITICAL THINKING If two lines intersect, then they intersect in exactly one point by the Line Intersection Postulate (Postulate 2.3). Provide a counter example for each false conditional statement in Exercises 17 – 24 on page 71. RS + QR = QS 4. The measures complementary angles sum to 90° Answer: In Exercises 13 – 16. \(\frac{1}{3}, \frac{1}{2}, \frac{2}{3}, \frac{5}{6}\), ... Answer: Question 5. AD is the absolute value of the difference of the coordinates of A and D. solve the equation. Answer: d. Given ∠1 and ∠3 arc vertical angles. Segment Addition Postulate (Post. Is the converse of our statement true or false? 2m∠1 = 180° 5. Maybe it's a carryover from school? 5x + y = 18 Answer: Question 16. If you get an A on your math test. In the worst-case scenarios, a confidently-delivered wrong answer is dangerous and expensive. Using the scale. Substitution Property Of Equality 6. If x < – 2, then |x| > 2. Given ∠ABD is a right angle ∠CBE is a right angle Prove ∠ABC ≅ ∠DBE Statements Reasons 1. If you miss practice the day before a game. If a point divides a line segment into two congruent line segments. m∠2 + m∠3 = 180° Answer: Question 28. AB + BC = AC, CD + DE = CE 4. REASONING Fold two corners of a piece of paper So their edges match. If you really feel that you have the answer for every issue that comes up at work, then I'd argue you've stayed too long in your current role. Name two planes containing \(\overline{B C}\). Answer: Question 11. REASONING Select all the properties that would also apply to inequalities. AB + BC = BC + DE 2. (C) If you cannot watch a movie afterward. Two planes intersect at a line. state the postulate illustrated by the diagram. Thank you very much for your cooperation. as shown. WRITING Compare the Reflexive Property of Equality with the Symmetric Property of Equality. You really don't know everything. Show that m∠1 = m∠3. m∠1 = 143° Answer: Question 8. Rational numbers can be written as fractions. and m∠1 33°. PROVING A THEOREM Copy and complete the two – column proof for the Congruent Supplement Theorem (Theorem 2.4). Find both answers. Answer: c. Answer: Question 37. Your friend claims that the statement “If I got a strike, then I used thegreen ball” can be written as a true biconditional statement. Line-Point Postulate Answer: c. AB = BC 4. rewrite the statements as a single biconditional statement. Answer: Question 51. ∠JMF and ∠FMG are supplementary. No trapezoids are rectangles. 1. How can you use a flowchart to prove a mathematical statement? based on the conditional statement “If I study, then I will pass the final exam.” a. _____ Question 19. MULTIPLE REPRESENTATIONS Create a Venn diagram representing each conditional statement. and the biconditional of the conditional statement. Use line segments to draw a diagram that represents this situation. Given m∠1 = m∠3 Prove m∠EBA = m∠CBD Statements Reasons 1. Answer: ERROR ANALYSIS In Exercises 15 and 16, describe and correct the error in using the diagram to find the value of x. Let p be “it does not snow” and let q be I will run outside.” Answer: Question 22. You and your friend are bowling. Question 9. m∠EBA = m∠2 + m∠1 3. \(\overline{X Y}\) intersecting \(\overline{W V}\) at point A. 2x + 7 = 1. Mineral C is scratched by all three of the other minerals. Answer: Exploration 3 Determining Whether a Statement is True or False Work with a partner: Determine whether each conditional statement is true or false. Is our friend correct? WRITING How is a theorem different from a postulate? m∠4 _____ m∠7 Answer: c. Use the Law of Syllogism to write a new conditional statement that follows from the pair of true statements: If x = 3, then 2x = 6. By the _____ m∠1 + m∠2 = m∠1 + m∠3. What must be true about points E, F, and G to force planes P and Q to be the same plane? because the measures of the angles are both 90°. Subtraction Property of Equality Answer: Exploration 2 Matching Reasons in a Flowchart Proof Work with a partner. Let p be “the Sun is out” and let q be “it is day time” Answer: Question 23. 39 – 5z = -1 + 5z Answer: Question 4. Definition: If an angle is a right angle. m∠FHE _____ m∠AHG Answer: d. write the conditional statement p → q. Research to find a real-world example of this pattern. use the property to copy and complete the statement. Let p be “you are in math class” and let q be “you are in Geometry:” Answer: Question 19. at point H. Justify your answer. Answer: Lesson 2.3 Postulates and Diagrams Monitoring progress Question 1. Question 2. Explain the purpose of justifying each step in Exercises 5-14 on page 96. 15x + 22 = 7x + 62 Answer: Question 18. Answer: Question 8. If a figure is a square, then the figure has four congruent sides. MATHEMATICAL CONNECTIONS Use inductive reasoning to write a formula for the sum of the first n positive even integers. COMPLETE THE SENTENCE Through any _____ non collinear points. 2.7), any two planes intersect in a line. Solve the formula for h and justify each step. Use the information to write at least two true conditional statements. Line Intersection Postulate Answer: Refer back to Example 3. Question 31. If yesterday was Wednesday, then today is Thursday. ∠JMF and ∠HMG arc vertical angles. Let p be “two angles are supplementary” and let q be “the measures of the angles sum to 180° Answer: Question 18. _____ 4. In Example 5. Create a diagram to model each statement in Exercises 5-10 on page 103. Use the given information and the figure to write a proof for the statement. Answer: Question 69. If c = d, then d = c. m∠DAC = m∠DAE + m∠EAB Answer: Question 49. then it is a right angle. They're the most memorable. Answer: 2.6 Proving Geometric Relationships Exploration 1 Matching Reasons in a Flowchart Proof work with a partner: Match each reason with the correct step in the flowchart. Let p be “it is Valentine’s Day” and let q be “it is February. Then write a paragraph proof. Decide whether inductive reasoning or deductive reasoning is used to reach the conclusion. m∠EBA = _____ 4. Question 13. Answer: Question 15. solve the equation for the given variable. (C) intersects . Testing a mineral’s hardness can help identify the mineral. \(\overline{D E} \cong \overline{D E}\) Answer: Question 9. Plane-Line Postulate (Postulate 2.6) Answer: In Exercises 9 – 12. then you like science. Then find the height of a standard yield sign when the area is 558 square inches and each side is 36 inches. Answer: 2.2 Inductive and Deductive Reasoning Exploration 1 Writing a Conjecture Work with a partner: Write a conjecture about the pattern. Some rectangles are not squares. Question 10. Complete the statements that correspond to each reason. If two lines form vertical angles, then they intersect. the sum of three odd integers Answer: Question 13. Name a pair of vertical angles. Then use the symbols to represent both statements. Write the related conditional statements. She came off as arrogant because she had an answer for everything. If you go on a hike, your Friend goes with you. ∠3 is a supplement of ∠2, and m∠2 = 147°. m∠1 + m∠1 = 180° 4. you will go to the movies with your friend. Describe and correct the error in the reasoning. Explain how you can give two of the angle measures so that you can find the remaining four angle measures. m∠1 + m∠2 = 90° 3. ∠1 and ∠2 are supplementary ∠3 and ∠4 are supplementary ∠1 ≅ ∠4 1. Show that AB = CD. He clearly wasn't interested in working with someone like her--and, based on what I saw, I wouldn't be either.The alternative is to think about your knowledge and ability to answer questions in three tiers: basic, stretch, and growth.You absolutely should have the basic, foundational knowledge needed to fulfill the role you're paid to play. 2, \(\frac{4}{3}, \frac{8}{9}, \frac{16}{27}\), ... WRITING Write a conditional statement that is true, but its converse is false. the quotient of a number and its reciprocal Answer: Question 12. How can you use reasoning to solve problems? Let p be “the stars are visible” and let q be “it is night.” Answer: Use the diagram. Find in m∠4. Answer: Question 20. then x = 3. 1.2) 4. z = 2x + 6xy Answer: Question 13. If an item has Property B. ∠1 and ∠2 are complementary. 6. then 5a = 15. Answer: In Exercises 3 – 6. _____ Answer: In Exercises 5-10, name the property that the statement illustrates. Answer: Question 55. What additional test(s) can you use to identify all the minerals in part (a)? Answer: Question 47. Quadrilateral ABCD is a parallelogram. VOCABULARY What are the two types of angles that are formed by intersecting lines? Make a truth table for the conditional statement ~(p → q). Answer: e. Question 39. So. m∠1 = 30° and m∠2 = 60° Argument 2: If two angles measure 30° and 60°. then it is a rectangle.” Answer: Communicate Your Answer Question 4. If you can run for President. I will pass the final exam if and only if I study. Substitution Property of Equality 6. p q ~ → ↔ Answer: USING STRUCTURE In Exercises 49 – 52. Given \(\overline{Q R} \cong \overline{P Q}, \overline{R S} \cong \overline{P Q}\) Answer: Maintaining Mathematical Proficiency Use the figure Question 24. If 4x = 12. Question 11. ∠MRL and ∠MRS are supplementary. \(\overline{A C} \cong \overline{C E} \) 6. ERROR ANALYSIS Describe and correct the error in writing the converse of the conditional statement. Answer: Question 12. ST = TU 3. Write one true conditional statement and one false conditional statement that are different from those given in Exploration 3. CRITICAL THINKING One example of a conditional statement involving dates is “If today is August 31, then tomorrow is September 1 Write a conditional statement using dates from two different months so that the truth value depends on when the statement is read. They stick with you and have the potential to change the course of your most important work.Seeking out the questions that will push you at work will not only make you grow as a person, it will also show your team that you're humble and willing to learn, two underrated but excellent qualities in a leader. Therefore, polygon ABCD is a square. CONSTRUCTING VIABLE ARGUMENTS To be proficient in math, you need to justify your conclusions and communicate them to others. If an angle measures 90°. Line lies in plane DBC. MULTIPLE REPRESENTATIONS The formula to convert a temperature in degrees Fahrenheit (°F) to degrees Celsius (°C) is C = \(\frac{5}{9}\)(F – 32). – 2p – 9 = 10p – 17 Answer: Question 3. Points A, B, C, and E are coplanar. Question 5. Mineral A is scratched by Mineral B. Answer: In Exercises 7 – 12. You visit the zoo and notice the following The elephants, giraffes, lions, tigers, and zebras are located along a straight walkway. Given ∠AEB ≅ ∠DEC Prove ∠AEC ≅ ∠DEB Answer: Question 24. Question 49. m∠1 + m∠2 = 180 m∠3 + m∠4 = 180 2. located in Thompson, Utah. 6x + 17 = – 7 Answer: Question 7. Rewrite the two-column proof in Example 3 without using the Congruent Supplements Theorem. d. Answer: 2.1 Conditional Statements Exploration 1 Determining Whether a Statement is True or False Work with a partner: A hypothesis can either be true or false. WRITING How can you save time writing proofs? ∠CDE, a straight angle, is bisected by . Question 4. Then write it as a conditional statement. Question 8. Congruent Supplements Theorem (Theorem 2.4) ∠PSK ∠KSN ∠PSR ∠QRS ∠QRL Answer: Question 8. Adjacent angles are two angles that share a common vertex and side but have no common interior points. so Mozart is mortal. A trapezoid has four sides. Three Point Postulate (Postulate 2.4) Answer: Question 8. If Δ ADC is a right triangle, then the Pythagorean Theorem is valid for ΔADC. ~ p → q Answer: Question 40. If a data set has a mean. Prove AB = CD Answer: Lesson 2.5 Proving Statements about Segments and Angles Monitoring Progress Question 1. THOUGHT PROVOKING The first two terms of a sequence are \(\frac{1}{4}\) and \(\frac{1}{2}\) Describe three different possible Patterns for the sequence. ∠2 ≅ ∠3 2. A plane is the surface of the sphere. and point x is the midpoint of all three segments. The number of girls participating in high school lacrosse will exceed the number of boys participating in high school lacrosse in Year 9. A relation that pairs each input with exactly one output is a function. Answer: In Exercises 29 and 30, use inductive reasoning to make a conjecture about the given quantity. If a polygon has four sides, then it is a quadrilateral. Make a table that shows the conversion to Fahrenheit for each temperature: 0°C. Copy and complete the flowchart proof. q → ~ p Answer: Question 44. CRITICAL THINKING Geologists use the Mohs’ scale to determine a mineral’s hardness. Use the diagram to write an example of each postulate. C is the midpoint of \(\overline{B D}\). The measure of ∠R is 155°. Use the Law of Detachment to make a valid conclusion. m∠1 + m∠2 = 90° Prove ∠3 ≅∠1 Answer: Reasoning and Proofs Test Use the diagram to determine whether you can assume the statement. 2.2) Answer: PROOF Exercises 13 and 14. WRITING Explain why all right angles are congruent. Write a proof using any format Given ∠3 and ∠2 are complementary. If BC = XY and XY = 8, then BC = 8. Then find the length of one of the bases of the trapezoid when the area of the trapezoid is 91 square meters. \(\overline{C B} \cong \overline{A C}\) by the Transitive Property of Segment Congruence (Thin. ~ q → p Answer: Question 41. Given AB = DE, BC = CD Prove \(\overline{A C} \cong \overline{C E}\) Statements Reasons 1. _____ 5. Answer: Question 46. Use the figure to write Given and Prove statements for each conclusion. Point M is the midpoint of \(\overline{F H}\). If I do not pass the final exam, then I did not study. FINDING A PATTERN The following are the first nine Fibonacci numbers. Then prove that the distance between the elephants and the giraffes is equal to the distance between the tigers and the zebras. a. THOUGHT PROVOKING Write examples from your everyday life lo help you remember the Reflexive, Symmetric, and Transitive Properties of Equality. Answer: Monitoring Progress and Modeling with Mathematics In Exercises 3 and 4, write the property that justifies each step. Given ∠QRS and ∠PSR are supplementary Prove ∠QRL ≅ ∠PSR Answer: Question 22. Answer: Maintaining Mathematical Proficiency Determine which postulate is illustrated by the statement. If a figure is a rectangle. Answer: 2.1 – 2.3 Quiz Rewrite the conditional statement in if-then form. So, the lines is a segment bisector of \(\overline{M N}\) Answer: In Exercises 17 – 20. If you are an athlete, then you play soccer. then LM = JK. Which statement does not belong with the other three? Answer: In Exercises 33 – 36. Draw and label a diagram that represents this information. MAKING AN ARGUMENT Your friend claims that even though two planes intersect in a line, it is possible for three planes to intersect in a point. If figure ABCD is a quadrilateral, then the sum of its angle measures is 180°. m∠4 = 29° Answer: In Exercises 11 – 14, find the values of x and y. 1, 4, 9, 16, ... m∠2 = m∠3 6. Who is correct? ∠ 1 is a complement of ∠4. Division Property of Equality 7. Two angles are vertical angles when their sides form two pairs of opposite rays. If ∠A and ∠B are complementary, then the sum of their measures is 180°. If x > 12, then x + 9 > 20. Question 33. then ∠H ≅ ∠G. C(- 5, 8), D(5, 8) Answer: c. ΔABC is a right triangle. Use inductive reasoning to make a conjecture about the sum of a number and itself. Simplify 6. Answer: ERROR ANALYSIS In Exercises 21 and 22. ∠ABC, an acute angle, is bisected by . 8, 2, – 4, – 10, ... Answer: Solve the literal equation for x. Question 12. So. ∠2 ≅∠3 by the definition of _____ . 1, 1, 2, 3, 5, 8, 13, 21, 34, ... Use the diagram in Example 2 to write an example of the postulate. Mozart is a man. Given 2. Write a two-column proof. Use the equation to test your conjecture for other values of x. ∠B is a right angle. Name three planes containing point D. _____ Answer: PROOF In Exercises 21 – 24. Write the next three numbers in the pattern. _____ 5. Is your friend’s interpretation 0f the Plane Intersection Postulate (Post. In spherical geometry. List five of the seven Point, Line, and Plane Postulates on page 84 that the diagram of the house demonstrates. _____ 3. Then use your conjecture to draw the 10th object in the pattern. m∠EBA = m∠2 + m∠3 2. 12, 23, 34, 45 ..... Prove ∠1 ≅ ∠3 Answer: (See Example 5.) Given ∠1 and ∠2 are supplementary ∠3 and ∠4 are supplementary ∠1 and ∠4 Prove ∠2 ≅∠3 Statements Reasons 1. Which postulate guarantees this process works for an two linear equations? The acute angles of a right triangle are complementary. Given statement: You can watch a movie after you do your homework. make and test a conjecture about the given quantity. The measure of ∠1 is 30° and the measure of ∠2 is 60°. PQ + QR = RS + QR 2. a hot dog stand is located halfway between the shoe store and the pizza shop. (A) If AC = RS, then RS = AC. then one of the angles must be acute. Answer: Question 22. Polygon ABCD is not a square. m∠1 = m∠2 and m∠2 = m∠5. If you've literally mastered every angle of the job, it's time to go. ∠DBE and ∠CBD are complementary 3. WRITING Explain why you do not use inductive reasoning when writing a proof. Answer: Question 40. WRITING Explain the difference between inductive reasoning and deductive reasoning. If so, write a biconditional statement. draw two perpendicular lines. State which theorem or postulate. Answer: Question 23. Answer: Exploration 2 Interpreting a Diagram Work with a partner: When you draw a diagram, you are communicating with others. Make and test a conjecture about the sum of any five consecutive integers. Write each sLaternenl in if-then form. Question 2. lies in plane P. 1.4) Answer: B. What are the other two types of related conditional statements? ∠1 ≅ ∠2 ∠1 and ∠2 are supplementary 1. If-then statement: If did not ride my bike to school, then I walked to school. Create a truth table for each of your answers to Exercise 59 on page 74. Answer: f. Explain your reasoning. REASONING Which statement has the same meaning as the given statement? (A) If you do your homework, then you can watch a movie afterward. MAKING AN ARGUMENT Your friend claims the statement “If I bought a shirt, then I went to the mall’ can he written as a true biconditional statement. Answer: In Exercises 3 and 4, write the negation of the statement. y = 8x – x Answer: Question 11. Answer: g. and you play the drums. 3x – 12 = 7x + 8 Given – 4x – 12 = 8 _____ – 4x = 20 _____ x = – 5 _____ Answer: Question 4. Answer: In Exercises 17 – 24. Answer: Question 41. Enter the reasons in the correct positions to complete the two-column proof. Two Point Postulate (Postulate 2.1) Answer: Question 28. Answer: Question 56. 2x – 8 = 6x – 20 Answer: Question 8. Given B is the midpoint of \(\overline{A C}\). REASONING In the sculpture shown, \(\angle 1 \cong \angle 2\) and \(\angle 2 \cong \angle 3\) classify the triangle and justify your answer. CRITICAL THINKING The largest natural arch in the United States is Landscape Arch. Question 22. If you like math. ABSTRACT REASONING Can you use the equation for an arithmetic sequence to write an equation for the sequence 3, 9, 27, 81. if any, supports your answer. 64 is a multiple of 8. 4(5x – 9) = – 2(x + 7) Answer: Question 14. Your teacher assigns your class a homework problem that asks you to prove the Vertical Angles Congruence Theorem (Theorem 2.6) using the picture and information given at the right. Compare the flowchart proofs above with the two-column proofs in the Section 2.5 Explorations. Answer: Communicate Your Answer Question 3. Answer: Question 13. Answer: 2.4 – 2.6 Performance Task: Induction and the Next Dimension Mathematical Practices Question 1. Answer: Question 27. T is the midpoint of \(\overline{S U}\). ~ (q → p) Answer: Question 45. Find ZY and XW Answer: Question 52. Question 6. then the point is a midpoint. Yellowstone is a national park in Wyoming. there exists exactly one plane. Then state each algebraic property being illustrated. (B) If x = 9 then 9 = x. Find the perimeter of each figure. MAKING AN ARGUMENT You overhear your friend discussing the diagram shown with a classmate. Make a truth table for the conditional statement p → ~ q. Then (b) write the converse, inverse, and contrapositive and state which ones are true. Predict the perimeter of the 20th figure. Let p be “3x – 7 = 20” and let q be “x = 9.” Answer: Question 24. If an item has Property A, then it has Property C. 1, 3, 5, 7 ..... 1.4) 6. then you are at least 35 years old. (B) If you do not do your homework, then you can watch a movie afterward. Angle Addition Postulate (Post. Irrational numbers cannot be written as tractions. If a = 3. Each figure is made of squares that are 1 unit by 1 unit. \(\frac{x}{7}\) = 5 Answer: 2.1 – 2.3 Study Skills: Using the Features of Your Textbook to Prepare for Quizzes and Tests Mathematical Practices Question 1. 1.4) Answer: E. Sedimentary rock is formed from pieces of other rocks. Answer: In Exercises 27 and 28, (a) rewrite the postulate in if-then form. If an angle is obtuse, then ii has a measure between 90° and 180°. t – 6 = – 4 Answer: Question 36. Question 21. CONSTRUCTING VIABLE ARGUMENTS To be proficient in math, you need to distinguish correct logic or reasoning from that which is flawed. Answer: Maintaining Mathematical Proficiency Solve the equation. Write the converse of each conditional statement. then you wear a helmet. Answer: In Exercises 25 – 28, decide whether the statement about the diagram is true. m∠ABD + m∠DBC = m∠ABC Answer: 2.5 Proving Statements about Segments and Angles Exploration 1 Writing Reasons in a proof Work with a partner: Four steps of a proof are shown. So, 64 is divisible by 4. Explain our reasoning. then it is obtuse. 3x + 7 = – 7 + 9y Answer: In Exercises 21 – 24. Determine whether you can make each conjecture from the graph. 7x = 3x + 20 4. m∠1 + m∠2 = 180° 3. then AB + EF = _____ . Then rewrite the conditional statement in if-then form. Solve the formula for F. Two right angles are supplementary angles. Using the Law of Detachment. What conjecture can you make about the relation between the weights of female tigers and the weights of male tigers? Given ∠1 is a right angle. copy the conditional statement. Rewrite the statements as a single biconditional statement. Name a pair of supplementary angles in the diagram. plane P and line m intersection plane P at a 90° angle Answer: Question 10. Therefore, polygon ABCD is not a rectangle. Most of the time, though, it's just a colossal waste of time. 4x + 9 = 21 because x = 3. Definition of congruent segments 4. Then write an equation for y in terms of x. all points are points on the surface of a sphere. Definitions of congruent angles 3. decide whether inductive reasoning or deductive reasoning is used to reach the conclusion. then ∠1 ≅∠2. The formula for the area A of a triangle is A = \(\frac{1}{2}\)bh, where b is the base and h is the height. Rewrite the definition of congruent segments as a single biconditional statement. And, you should intentionally put yourself in situations that will challenge your thinking by exposing you to questions you couldn't possibly expect. Solve the formula for b1. Points K, L, M, and N are coplanar. Question 20. All 30° angles are acute angles. then ills a rectangle. 9x + 31 = – 23 + 3x Answer: Question 8. Then write several conditional statements that are shown in your diagram. There is a 3-mile-long trail near your campsite. PROVING A THEOREM Copy and complete the paragraph proof be the Congruent Complements Theorem (Theorem 2.5). ZY = ZY Answer: Question 13. 26, 22, 18, 14, ... Answer: Question 6. MATHEMATICAL CONNECTIONS In the figure, \(\overline{Z Y}\) ≅ \(\overline{X W}\), ZX = 5x + 17, YW = 10 – 2x, and YX = 3. the sum of two odd integers Answer: Question 30. Write a two-column proof to show that the angle measure is always the same no matter how you make the folds. If you are at least 35 years old. On a piece of paper. Question 29. c. I know, and I'm sorry, but it's true.You have to say, "I don't know" regularly, and here's why.Responding to questions under pressure or out of habit typically doesn't result in the most well thought-out answers. then it is June. Answer: Lesson 2.4 Algebraic Reasoning Monitoring Progress Solve the equation. Answer: In Exercises 39 – 44. Answer: Question 67. The four minerals are randomly labeled A, B, C, and D. If LM = RS and RS = 25, then LM = 25. Answer: Lesson 2.2 Inductive and Deductive Reasoning Monitoring Progress Question 1. Find an advertisement or write your own slogan. m∠ABC = 90° Answer: Question 26. PQ = ST, so ST = PQ. Answer: Maintaining Mathematical Proficiency Find the pattern. then the angles are complementary. You passed the final. If a figure is a parallelogram, then the figure has two pairs of opposite sides that are parallel. = ≅ ≠ a. Use the Law of Syllogism to write a new conditional statement that follows from the pair of true statements. ∠ABC is supplementary to ∠CBD ∠CBD is supplementary to ∠DEF Answer: In Exercises 7 – 10. WRITING Explain why you need at least three noncollinear points to determine a plane. _____ 2. Answer: Use the diagram and the given angle measure to find the other three angle measures. Two Point Postulate Answer: b. J(- 4, – 2), K(1, – 5) Answer: f. Subtraction Property of Equality

Line m intersects line at point it. Can you assume that plane S intersects plane T at ? When is a conditional statement true or false? If this month has 31 days. Then write or draw the next two numbers, letters, or figures. Answer: Question 24. MAKING AN ARGUMENT Your friend claims that by the Plane Intersection Postulate (Post. Write the property that justifies each of the following solution steps. Answer: Use the diagram in Example 4. h spans 290 feet. Answer: Question 43. I love not wasting time even more than I love having the right answer. Select all that apply. Classify each related conditional statement. then it has a measure of 30°. If polygon ABCD is a square. MATHEMATICAL CONNECTIONS Find the measure of each angle in the diagram. I recently saw an episode of Shark Tank where the contestant was turned down by Mark Cuban. VOCABULARY What type of statements are either both true or both false? 5(3x – 20) = – 10 Answer: Question 10. (E) Plane T ⊥ plane S. 9 + x = 13 Answer: Question 38. Maybe it's simply being a hardcore people pleaser at heart?Whatever my reason and whatever yours, our quest to correctly answer every question can actually hold us back at work. Use the diagram of line m and point C. Answer: Question 4. 3(7x – 9) – 19x – 15 Answer: Write the if-then form, the converse, the inverse, the contrapositive. ∠CBE is a right angle. Statements Reasons 1. If a figure is a rhombus then the figure is a parallelogram. If you run, then you are fast. Plane EAF is parallel to plane DBC. because x = – 3. and I'm going to find out" or "...I'll get back to you" or "...what do you think?"Now, this isn't an excuse not to prepare like crazy for questions you anticipate getting during your next big presentation. Then find the base of a triangle whose area is 952 square feet and whose height is 56 feet. the product of any two even integers Answer: Question 10. Two lines intersect in a Point. List all segment bisectors given x = 3. Given \(\overline{A B}\) ⊥ \(\overline{B C}\), \(\overline{D C}\) ⊥ \(\overline{B C}\) Prove ∠B ≅ ∠C Answer: Question 2. Look at the diagram from different angles. AB + BC = AC Answer: Question 48. ∠F ≅ ∠F Answer: Question 7. Points Q, J, and M are collinear. (A) A, B, and C are coplanar. 3(3x + 14) = – 3 Answer: Question 5. I get it. Answer: Exercise 2.4 Algebraic Reasoning Vocabulary and Core Concept Check Question 1. The distance from the shoe store to the movie theater is the same as the distance from the movie theater to the cafe, and from the florist to the dry cleaners. then its measure is less than 90°. 2.1) Answer: Question 12. If points A, B, and C are collinear, then the lie on the same line. So, ∠1 and ∠2 are complementary. Copy and complete the two-column proof. Figure ABC is a triangle. Commutative Property of Addition 5. If I pass the final exam, then I studied. If n is a nonzero integer, then \(\frac{n+1}{n}\) is always greater than 1. ANALYZING RELATIONSHIPS Copy and complete the table to show that m∠2 = m∠3. These are the most fascinating, growth-sparking questions you'll get. rewrite the conditional statement in if-then form. 4x + 9 = 16 – 3x Answer: Question 9. If a polygon has three sides. All multiples of 8 are divisible by 4. Argument 1: If two angles measure 30° and 60° then the angles are complementary. Write the converse of the statement in part (a). _____ Answer: Exploration 2 Writing Steps in a Proof Work with a partner: Six steps of a proof are shown. 5x – 10 = – 40 Answer: Question 6. Answer: ERROR ANALYSIS In Exercises 41 and 42, describe and correct the error in solving the equation. Given ∠MRS and ∠NSR are supplementary. Answer: Exercise 2.2 Inductive and Deductive Reasoning Vocabulary and Core Concept Check Question 1. Is the converse of each statement true? J, F, M, A, M, ... MODELING WITH MATHEMATICS The distance fr the restaurant to the shoe store is the same as the distance from the cafe to the florist. Given ∠GFH ≅ ∠GHF Prove ∠EFG and ∠GHF are supplementary Answer: Question 14. 12 – 3y = 30x + 6 Answer: Question 20. Solve the formula for l. Angle Addition Postulate (Post.1.4) 3. – 4x + 2y = 8 Answer: Question 17. ? Show that PH = HM. REASONING The table Shows the average weights of several subspecies of tigers. – 9x – 21 = – 20x – 87 Answer: Question 17. 5x + 2(2x – 23) = – 154 Answer: Name the property of equality that the statement illustrates. So. the next time your mom goes to the store. Find m∠3. use the diagram and the given angle measure to find the other three measures. If an angle is acute. Most other people feel the same.By always having an answer, you inadvertently undermine your credibility. Make sketches to support your answers. m∠1 + m∠2 = _____ 5. Symmetric Property oI Equality: If m∠1 = m∠2. What do you notice about the angle formed at the top of the page by the folds? Quadrilateral ABCD is a trapezoid. Transitive Property of Equality Answer: Communicate Your Answer Question 3. Justify each step. Plane-Point Postulate (Postulate 2.5) Answer: Question 29. If two angles are supplements of each other. Then order each line segment from longest to shortest. rhombuses, and kites. Transitive Property of Equality Answer: C. Find the distance between each pair of points. Each day, you get to school before your friend. You go on a hike. Use your table to graph the temperature in degrees Fahrenheit as a function of the temperature in degrees Celsius. Use the diagram in Exploration 2 to write two statements you can assume to be true and two statements you cannot assume to be true. Answer: Question 45. Answer: Communicate Your Answer Question 4. Answer: Question 21. List the first five terms for each sequence. Support your answer with definitions or theorems. write a question you would ask your friend about his or her interpretation. ~(~ p → ~ q) Answer: Question 42. Prove ∠1 ≅ ∠3 Answer: Reasoning and Proofs Cumulative Assessment Question 1. _____ 6. inverse, and contrapositive statements.) Question 2. Substitution Property of Equality 4. 2.8, 3.4, 4.0, 4.6, ... Answer: Question 4. m∠2 = 59° Answer: Question 6. Then write the converse, inverse, and contrapositive of the conditional statement. Planes M and P intersect at . Question 16. 1, – 2, 3, – 4, 5, ... Points F, B, and G are collinear. Commutative Property of Addition Answer: Communicate Your Answer Question 3. Answer: Question 2. (D) AB = BA (E) If AB = LW and LM = RT, then AB = RT. Will that help you determine whether the statement can be written as a true biconditional statement'? Substitution Property of Equality: If AB = 20. she buy s milk. Definition of supplementary angles 4. If x = y, then y = x. Given Answer: C. You went camping in Wyoming. Answer: Question 57. AB = BC ≅ AC 2. 1.2) Answer: B. Metamorphic rock is formed by changing, temperature, pressure, or chemistry. Is the converse true? Write the reasons for each statement Given AC = AB + AB Prove AB = BC REASONING ABSTRACTLY To be proficient in math, you need to know and be able to use algebraic properties. If JK = LW. If a polygon is a quadrilateral, then it has four sides. Answer: Question 34. m∠4 = 88° Answer: Question 7. Answer: In Exercises 33 – 40. AC = AB + AB 1. HOW DO YOU SEE IT? Question 66. Answer: In Exercises 25 – 28. Which type of related conditional statement must also be true? CRITICAL THINKING Is the converse of the Linear Pair Postulate (Postulate 2.8) true? ERROR ANALYSIS In the diagram \(\overline{M N} \cong \overline{L Q}\) and \(\overrightarrow{L Q} \cong \overrightarrow{P N}\). COMPLETE THE SENTENCE In a two-column proof, each _____ is on the left and each _____ is on the right. Answer: Question 3. More girls will participate in high school lacrosse in Year 8 than those who participated in Year 7. If polygon ABCD is a square, then it is a rectangle. 2.7) correct? Then write the next two numbers. THOUGHT PROVOKING Write three conditional statements. Answer: Question 65. 3(2x + 11) = 9 Answer: Question 11. Find a postulate on page 84 that is not true in spherical geometry. then it has four right angles. PROOF Copy and complete the two-column proof. write a paragraph proof. Name two planes containing point J. Line-Point Postulate (Postulate 2.2) Answer: Question 6. then you can go to the movies. _____ 7. or contrapositive of the conditional statement. (F) Point B bisects \(\overline{H C}\). The shirt is green. Distributive Property: If 5(x + 8) = 2, then ___ + ___ = 2. DRAWING CONCLUSIONS You measure the heights of your classmates to gel a data set. A line s divides \(\overline{M N}\) into two line segments. Answer: Question 14. Is this a linear function? copy and complete the proof. Answer: Question 59. If a polygon is a triangle, then it has three sides. If AB = LM, then LM = AB. Some items that have Property A do not have Property B. m∠1 + m∠2 = _____ 5. ~ (p → ~ q) Answer: Question 43. If Mary is in the fall play. The Venn diagram represents all the musicians at a high school. If I do not study, then I will not pass the final exam. Tell whether this statement is true: If s and y are the least and greatest values in your data set, then the mean of the data is between x and y. Supplementary angles sum to 180°. Justify your answers. Repeat Example 3. Answer: Question 62. ANALYZING RELATIONSHIPS In the diagram, AC = BD. The lake is cold. Answer: 2.2 Inductive and Deductive Reasoning Question 5 conclusion can you make about the difference of any two odd integers? Answer: Question 44. In an intense workplace where everyone is "faking it 'til they make it," there's pressure to always have the right answer to any given question. Answer: Find the pattern. THOUGHT PROVOKING The distance from Springfield to Lakewood City is equal to the distance from Springfield Lo Bettsille. Janisburg is 50 miles farther from Springfield titan Bettsville. _____ Answer: Question 4. (D) H, F, and D are coplanar. m∠1 = 117° Answer: Question 5. _____ 1. Question 57. Answer: Exploration 3 Reasoning and Venn Diagrams Work with a partner: Draw a Venn diagram that shows the relationship between different types of quadrilateral: squares. _____ = m∠3 + m∠4 3. 1.2) 5. 2(– x – 5) = 12 Answer: Question 12. Make and test a conjecture about the sign o1 the product of any three negative integers. y = 4x + zx + 6 Answer: Question 12. Answer: Exploration 2 Using a Venn Diagram Work with a partner: Use the Venn diagram to determine whether the statement is true or false. then the figure has four sides. a mineral with a higher rating will leave a scratch on a mineral with a lower rating. Remember that saying "I don't know" every once in a while doesn't make you look incompetent--it will actually increase your team's trust that you're always giving the truest answer you can.If you liked this column, subscribe to email alerts in the Work Life Lab and you'll never miss a post. Answer: Question 10. Then find the length of a rectangular lawn with a perimeter of 32 meters and a width of 5 meters. – 29, – 12, 5, 22, ... Given AC = AB + AB Prove AB = BC MODELING WITH MATHEMATICS To be proficient in math, you need to map relationships using such tools as diagrams, two-way tables, graphs, flowcharts, and formulas. PQ = RS 1. REWRITING A FORMULA The formula for the perimeter P of a rectangle is P = 2l + 2w, where l is the length and w is the width. Describe the pattern of the perimeters. Move vertically to gain greater perspective and visibility, or move laterally to a different industry to up the challenge that way. 6x – 11 = – 35 Answer: Question 2. If e = f and f = g, then e = g. If ∠L ≅ ∠M and ∠M ≅ ∠N, then ∠L ≅ ∠N. the product of two odd integers Answer: In Exercises 31 – 34. State what is given and what is to be proven for the situation. Prove ∠1 ≅ ∠4 Answer: Question 23. use the Law of Detachment to determine what you can conclude from the given information, if possible. If x = y, then 3x = 3y. m∠1 + m∠2 = 90° and _____ = 90°. WHICH ONE DOESN'T BELONG? _____ 3. I = Prt;P Answer: Question 23. parallelograms. MAKING AN ARGUMENT In the figure, \(\overline{S R} \cong \overline{C B}\) and \(\overline{A C} \cong \overline{Q R}\) Your friend claims that, because of this. REASONING Choose the correct symbol to go between the statements. Answer: Question 32. During the question and answer portion after her pitch, she left no room for reflection or opening to take Cuban's advice. Answer: Exploration 2 Determining Whether a Statement is True or False Work with a partner: Use the points in the coordinate plane to determine whether each statement is true or false. Question 27. Answer: PROOF In Exercises 11 and 12, write a two-column proof for the property. If 90° ∠ m ∠ R ∠ 180°, then ∠R is obtuse. It is important that you include sufficient information in the diagram. Answer: Question 54. Answer: Solve the equation. 44 – 2(3x + 4) = – 18x Answer: Question 13. rectangles. the height is 7 meters. Use the diagram to determine which of the following statements you can assume to be true. Do the lines appear perpendicular regardless of the angle at which you look at them? Three Point Postulate (Postulate 2.4): Through any three noncollinear points, there exists exactly one plane. The product of two positive numbers is always greater than either number, Answer: Question 14. then she must be taking theater class. Select all other angles that are also congruent to ∠NSR. Explain. Right angles are 90°. ΔBDC is an isosceles triangle. If ∠1 and ∠2 are vertical angles. Only people who are registered are allowed to vote. If a quadrilateral is a square. (F) If XY = EF, then FE = XY. Answer: Monitoring Progress and Modeling with Mathematics In Exercises 3-6. Write a two-column proof be the Reflexive Property of Angle Congruence (Thm. Then determine whether each conditional statement and its converse are true or false. So. \(\frac{1}{2}\) is a rational number Answer: Question 33. You will not start the game Wednesday. Definition: If two line segments have the same length. How are the properties similar? Answer: In Exercises 5 – 8, use the diagram to write an example of the postulate. the product of three even integers Answer: Question 14. where one is always true, one is always false, and one depends on the person interpreting the statement. Then explain your reasoning. b. then m∠1 = m∠2. Then determine their truth values. Question 64. Given ∠1 and ∠2 are complementary ∠1 and ∠3 are complementary Prove ∠2 ≅ ∠3 ∠1 and ∠2 are complementary, and ∠1 and ∠3 are complementary. Answer: In Exercises 21 – 24, use the Law of Syllogism to write a new conditional statement that follows from the pair of true statements, if possible. E(2, 7), F(4, – 2) Answer: d. Use the diagram in Example 2. Line Intersection Postulate (Postulate 2.3): If two lines intersect, then their intersection is exactly one point. 3(4x + 7) = 5(3x + 3) Answer: In Exercises 15 – 20, solve the equation for y. If x > 2. Answer: Question 18. ∠2 ≅ ∠3 Prove ∠1 is a complement of ∠3. If \(\overline{P Q} \cong \overline{S T}\) and \(\overline{S T} \cong \overline{U V}\), then \(\overline{P Q} \cong \overline{U V}\).\ Answer: Question 6. 3(2x + 9) = 30 Answer: Question 19. MATHEMATICAL CONNECTIONS A way to solve a system of two linear equations that intersect is to graph the lines and find the coordinates of their intersection. Answer: Question 17. Explain your answer using the definitions you have learned. ∠2 and ∠4 are complementary. (A) Addition Property Answer: (B) Subtraction Properly Answer: (C) Substitution Property Answer: (D) Reflexive Property Answer: (E) Symmetric Property Answer: (F) Transitive Property Answer: Maintaining Mathematical Proficiency Name the definition property, or postulate that is represented by each diagram. 0, 2, 6, 12, 20, ... then AB + CD = _____ . The sum of a positive number and a negative number is always positive. Each time your mom goes to the store. MAKING AN ARGUMENT Which argument is correct? If ∠1 ≅ ∠2 then m∠1 ≅ m∠2. Answer: Lesson 2.1 Conditional Statements Monitoring Progress Use red to identify the hypothesis and blue to identify the conclusion. Your friend claims that the last line of the proof should be ∠1 ≅ ∠2. PROOF Copy and complete the flowchart proof. Write a proof using an format. This is because everyone else knows you don't know everything, and you start to look silly by always giving a confident answer, even when it's obviously wrong. ATTENDING TO PRECISION Select all the statements about the diagram that you cannot conclude. Linear Pair Postulate (Postulate 2.8) 4. Which postulate guarantees this process works for any linear equation? Name three collinear points. x = x Answer: Question 28. then the _____ of the data set will always be a data value. m∠AHG + m∠GHE _____180° Answer: Question 6. A(- 6, 1), B(- 1, 6) Answer: b. 2y – 2x = 10 Answer: Question 8. Substitution Property of Equality Answer: D. An angle measure of 167° is an obtuse angle. The table shows the 1 – mile running times of the members of a high school track team. Justify each step Question 21. Answer: Question 42. Give an example of how you used reasoning to solve a real-life problem. m∠DBG = 90° Answer: Question 13. Then use deductive reasoning to show that the conjecture is true. Copy and complete the proof. If a month has 30 days. If an item has Property C. \(\overline{Z W}\) lies in plane P Answer: 2.4 Algebraic Reasoning Solve the equation. If Mary is in theater class, then she will be in the fall play. If a figure has four sides, then it is a rectangle. ∠ABD is a right angle. 4 = – 10b + 6(2 – b) Answer: Question 6. Sketch the fifth figure in the pattern in Example 1. Two angles are supplementary angles when the sum of their measures 180°. Write the converse of each of the statements in part (a). (D) If you can watch a movie afterward, then do not do your homework. Answer: ERROR ANALYSIS In Exercises 35 and 36, describe and correct the error in interpreting the statement. Then draw the next two figures in the sequence. _____ Answer: Question 3. Explain how you know Answer: Exercise 2.3 Postulates and Diagrams Vocabulary and Core Concept Check Question 1. Label them and . Plane Intersection Postulate (Postulate 2.7): If two planes intersect, then their intersection is a line Answer: Question 2. ERROR ANALYSIS Describe and correct the error in rewriting the conditional statement in if – then form. Answer: Question 48. Answer: Question 63. REASONING You are told that the contrapositive of a statement is true. Answer: Exercise 2.1 Conditional Statements Vocabulary and Core Concept Check Question 1. REWRITING A FORMULA The formula for the area A of a trapezoid is A = \(\frac{1}{2}\)h (b1 + b2), where h is the height and b1 and b2 are the lengths of the two bases. Answer: Question 68. the sum of two negative integers Answer: Question 7. Answer: Question 7. Question 25. Answer: Question 25. 3x = 21 Answer: Question 37. Points D, B, and C are coplanar. then it is a triangle. x = 5 6. I too love being right and having the most helpful advice for people. Answer: Find a counterexample to show that the conjecture is false. Answer: Question 50. DIFFERENT WORDS, SAME QUESTION Which is different? the converse q → p, the inverse ~ p → ~ q, and the contrapositive ~ q → ~ p in words. Question 7. write the negation of the statement. identify the pairs) of congruent angles in the figures. ANALYZING RELATIONSHIPS In the diagram, m∠ABD = m∠CBE. Question 15. _____ Answer: Exercise 2.5 Proving Statements about Segments and Angles Vocabulary and Core Concept Check Question 1. Answer: Question 29. Given ∠1 ≅ ∠3 Prove ∠2 ≅ ∠4 Answer: Question 18. Substitution property of Equality 6. . Answer: Lessson 2.6 Proving Geometric Relationships Monitoring Progress Question 1. \(\frac{1}{2} x-\frac{3}{4} y\) = – 2 Answer: Question 19. Then write a flowchart proof. Answer: Question 5. then MN = RS. Reflexive Properly of Equality: m∠ABC = _____ . Give an example of the Reflexive, Symmetric, and Transitive Properties of Equality. (B) Plane T intersects plane S in . S = 180(n – 2); n Answer: Question 24. ∠NKL and ∠JKM are vertical angles. ∠1 is a complement of ∠3. Describe all the angles at which you can l00k at the lines and have them appear perpendicular. Your friend went on a hike. substitution property of Equality 5. So, the next time you clean your room. Choose the symbol that makes each statement true. VOCABULARY How does the prefix "counter" help you understand the term counterexample? Prove x = 5 Statement Reason 1. 9x + 5 = 23, because x = 2. Given PQ = RS Prove PR = QS Statements Reasons 1. \(\overline{S T} \cong \overline{T U} \) 2. m∠1 = m∠2 2. such as "If a quadrilateral is a square. 5(x – 1) = 4x + 13 Given 5x – 5 = 4x + 13 _____ x – 5 = 13 _____ x = 18 _____ Answer: In Exercises 5 – 14. then it is not February. THOUGHT PROVOKING The postulates in this book represent Euclidean geometry. In a diagram, what can be assumed and what needs to be labeled?

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