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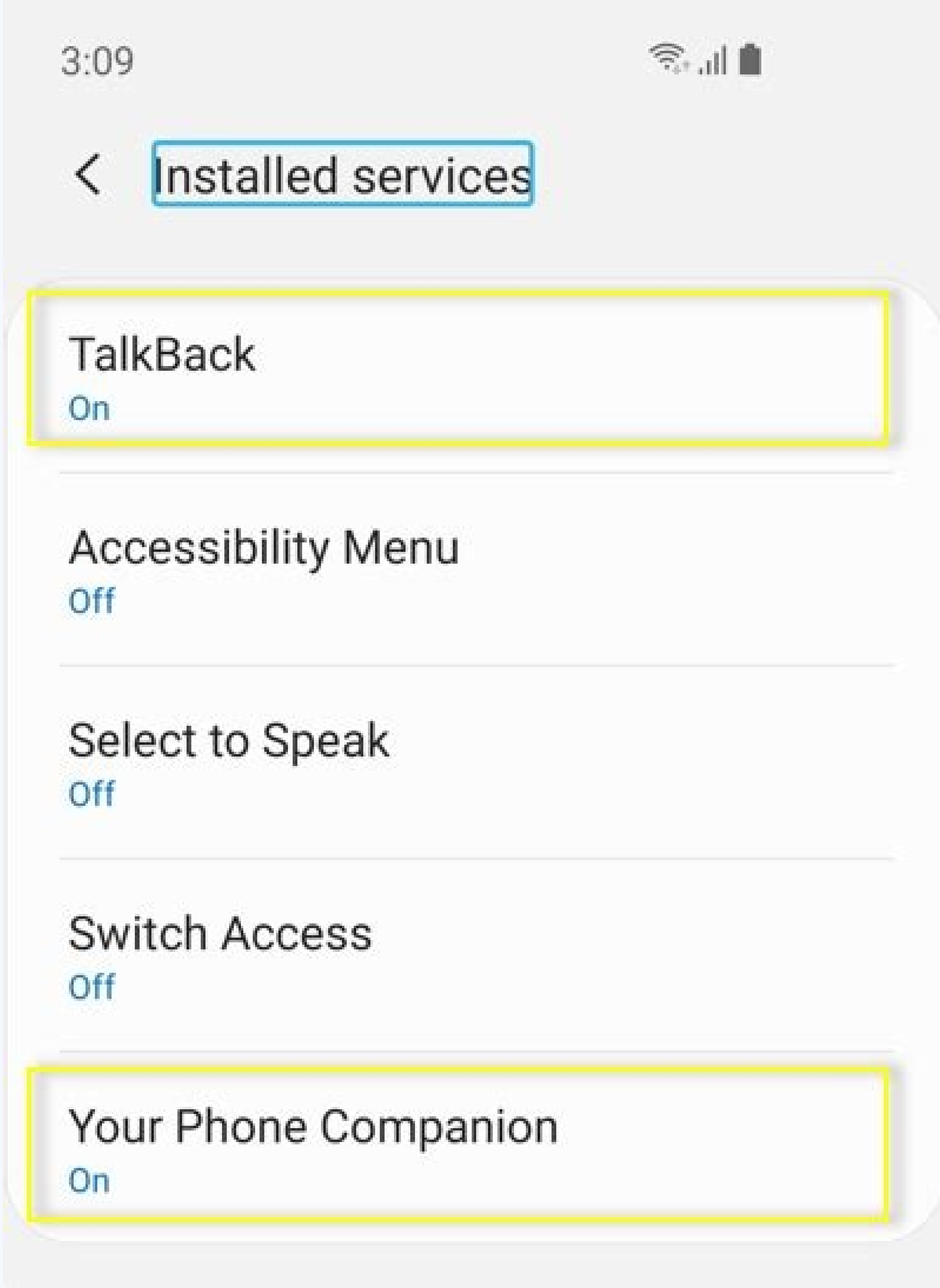
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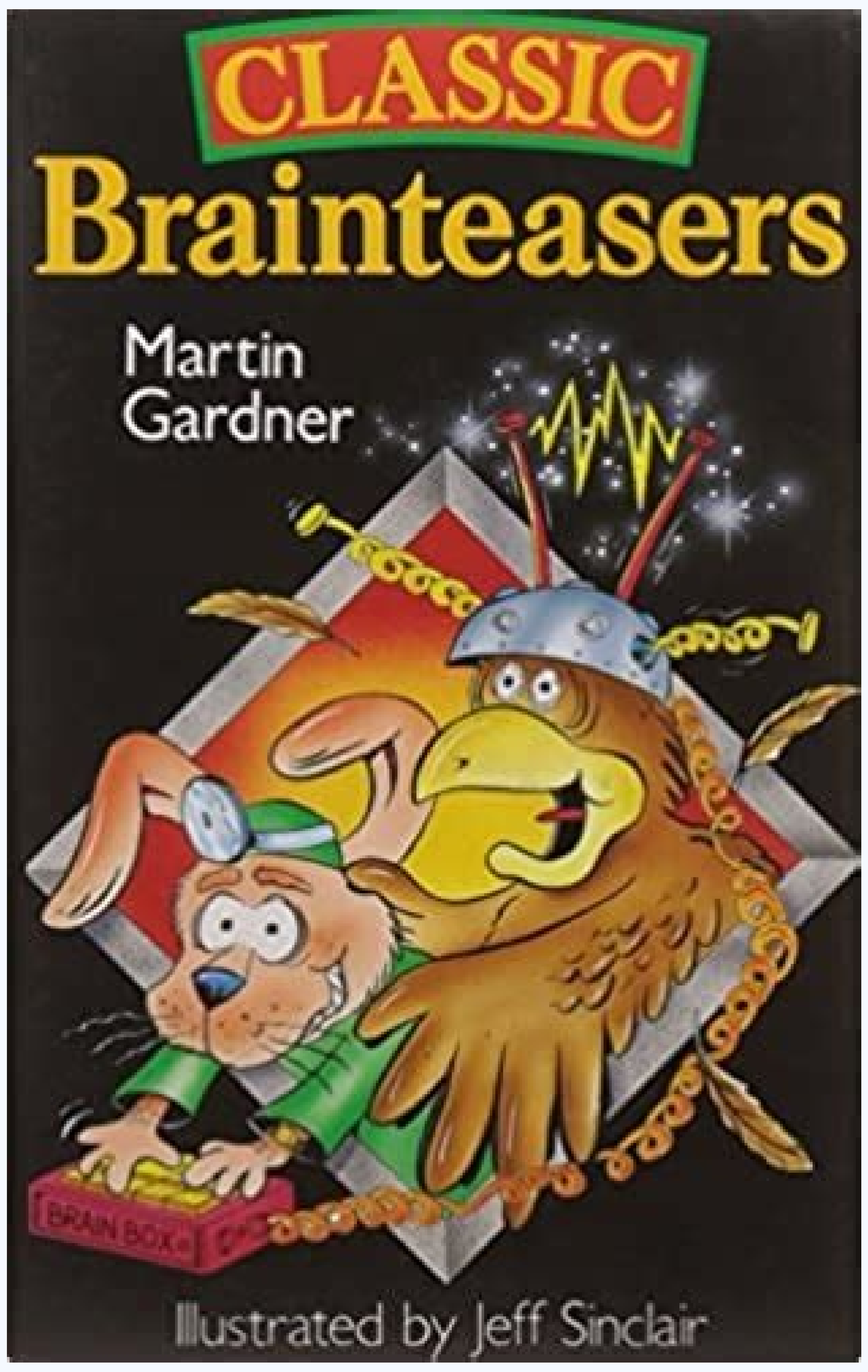
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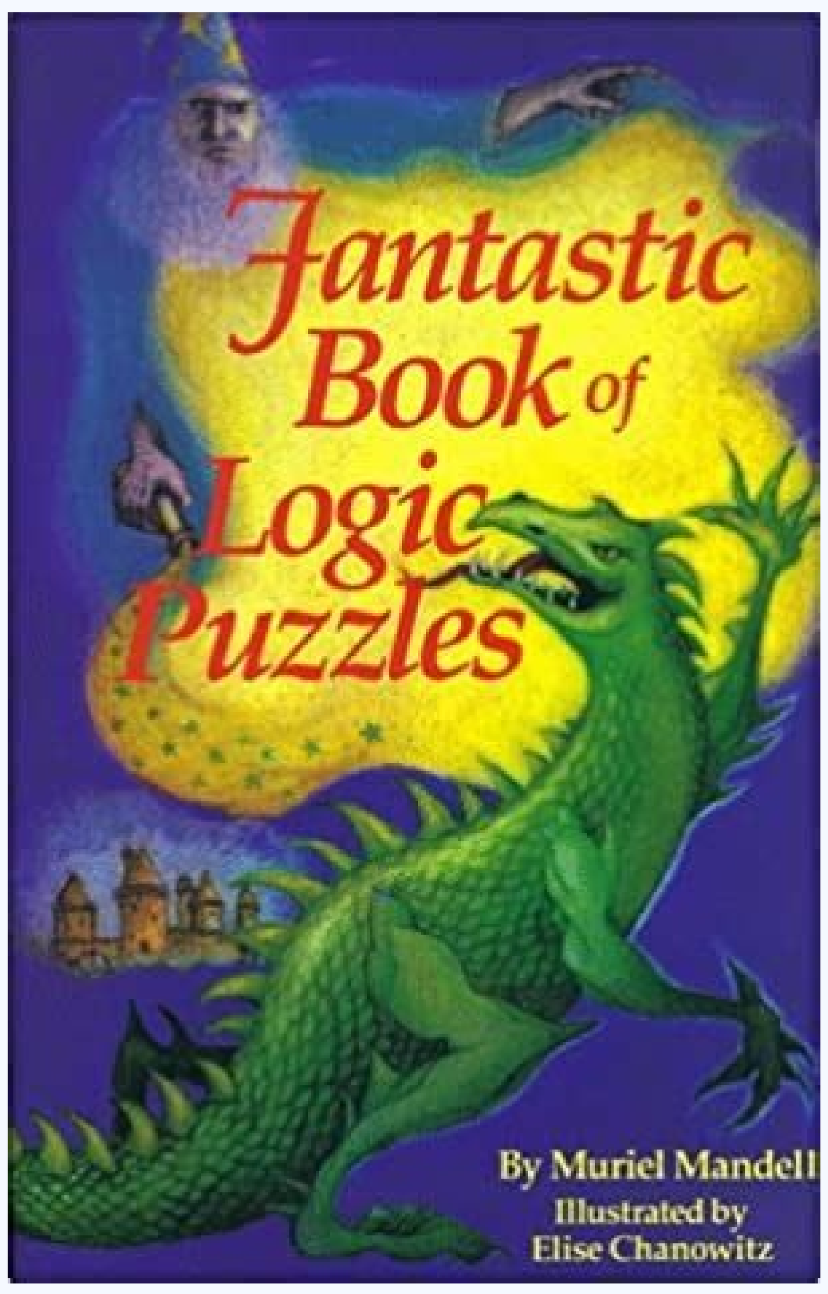
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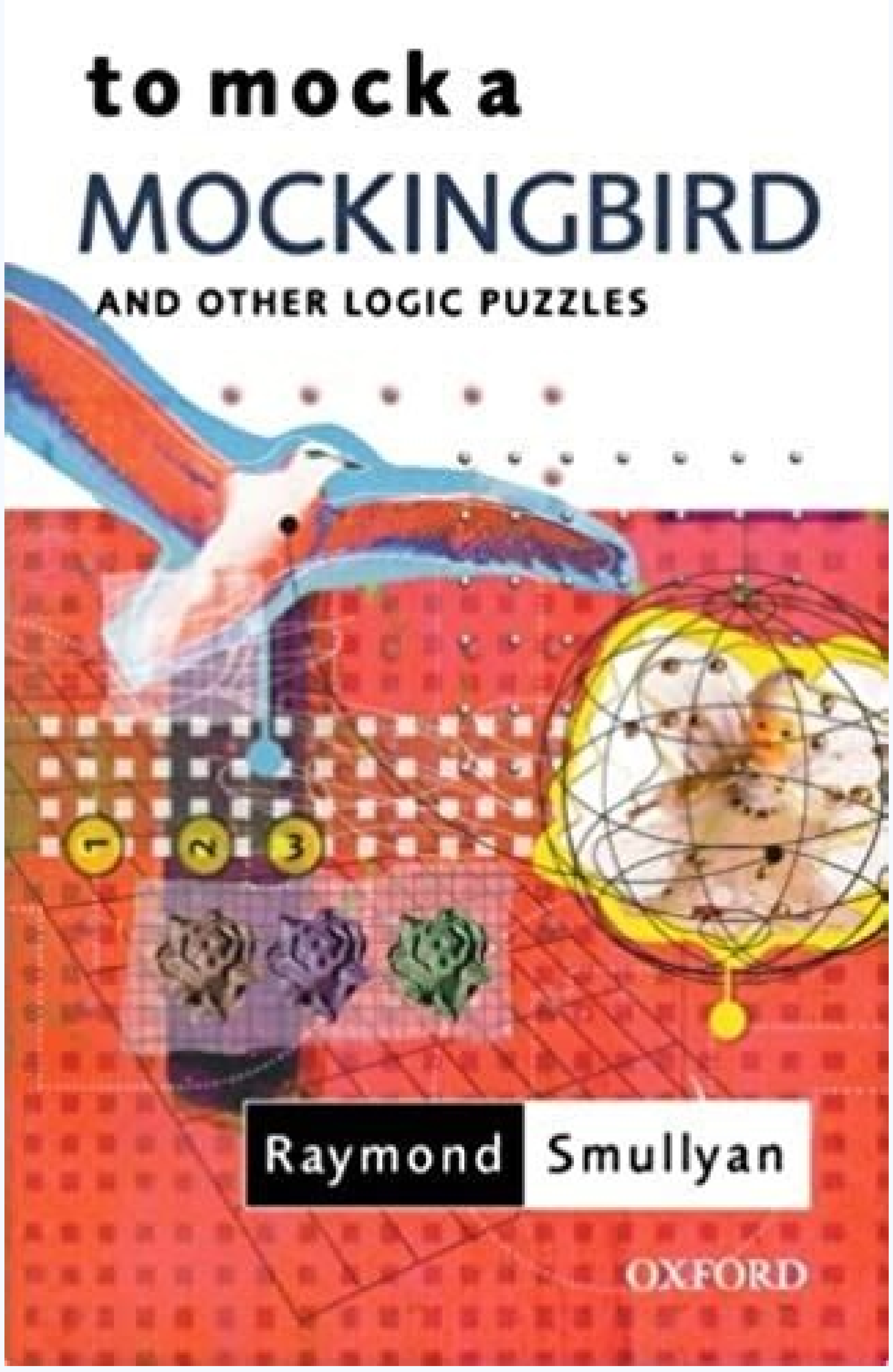

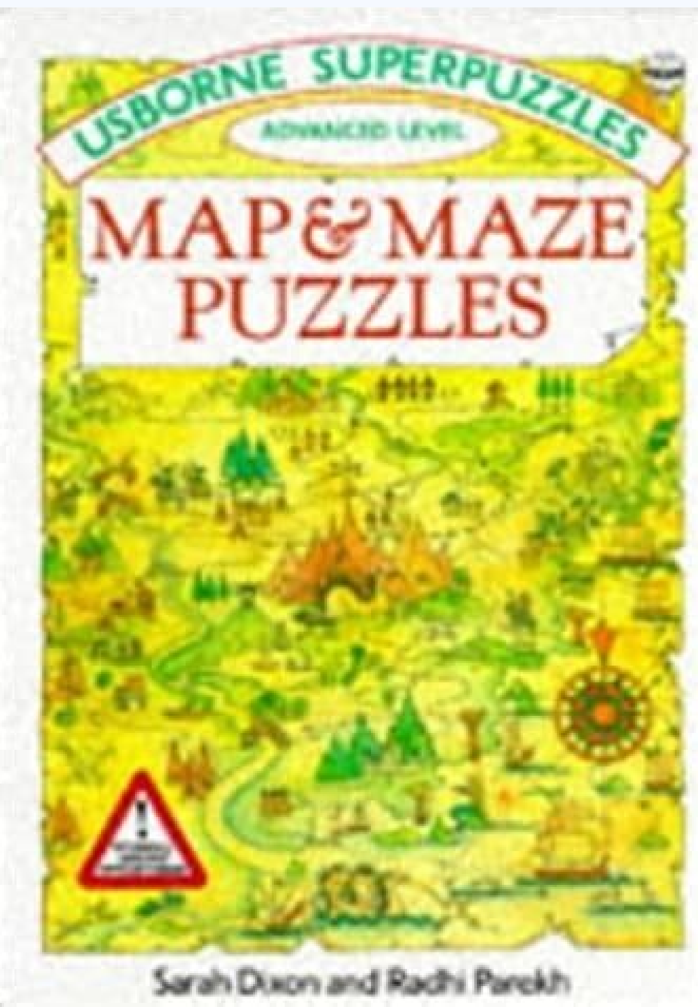

The requested URL was not found on this server. In addition, a 404 error was found Not found while trying to use an error document to handle the request. Apache/2.4.41 (Ubuntu) Server at m.central.edu Port 443 Showing 1-35 Start your review Full Analysis with Apps Michael Mvaluó really liked Apr 16, 2018 Elise rated that he really liked Mar 21, 2015 TTAA rated it as amazing Jun 14, 2015 Papaiah Mghada valued it very well Dr. Richard Silverman, editor and translator of the original, has prepared this shorter version to expressly meet the needs of a one-year postgraduate or undergraduate course in complex analysis. In his selection and adaptation of the most elementary themes of the most original work, he was guided by a brief course prepared by Markushevich himself. The book begins with the foundations, with a definition of complex numbers, its geometric representation, its algebra, powers and roots of complex numbers, the theory of sets as applied to complex analysis, and complex functions and sequences. The notions of the appropriate and improper complex numbers and infinity are explained completely and clearly, as is the stereo projection. Individual chapters cover limits and continuity,of analytical functions, polynomials and rational functions, Mobial transformations with their property reserved in circles, exponentials and logarithms, complex integrals and the theorem of Cauchy, complex series and uniform convergence, power series, Laurent series and singular points, the theorem of residues and their implications, harmonic functions (a topic very often mild in the first courses of complex analytics, fractions) Elementary functions receive a more detailed treatment than usual for a book at this level. In addition, there is an extensive discussion about the Schwarz-Christolfel transformation, which is particularly important for applications. There is a great abundance of examples worked, and more than three hundred problems (some with suggestions and answers), making this an excellent textbook for the use of the classroom, as well as for the independent study. A remarkable feature is the fact that the paternity of this volume makes it possible for the student to follow in more detail several advanced topics in the original three volumes, without the problem of having to adjust to a new terminology and notation. In this way, IntroductoryComplex Analysis serves as an introduction not only to the entire field of complex analysis, but also to the magnum opus of an important contemporary Russian mathematician. CHAPTER INDEX 1 COMPLEX NUMBERS, FUNCTIONS AND SEQUENCES 1. INTRODUCTORY COMMENTS Since the square of a real number is non-negative, even the simple quadratic equation has no real (raice) solutions. However, it seems perfectly reasonable to demand that any system of number suitable for computational purposes allow us to resolve the equation (1.1), or, for that matter, the general algebraic equation of grade n, where a0, a1,..., a are arbitrary real numbers. As already shown by (, and then considercomplexes of the form where a and b are real arbitrary numbers, and algebraic algebraicThey are defined in the natural way, that is, the expressions of the form (1.3) are treated exactly as binomials to + bx in an unknown X, except that the rule is used to eliminate all powers from I superior to the first. If this is done, the roots of (1.1) are the particularly simple complex number I and â € "i. In addition, adjustment b = 0, we see that the number number (1.3) include the real number as a special case (an essential characteristic). Surprisingly, as we will see later (Theorem 10.7, Corollario 2), it turns out that once we allow complex values, the equation (1.2) always has a rair, even if the coefficients A0, A1, ..., a They are themselves complex number, a result known as the fundamental theorem of ã¡lgebra. 2. COMPLEX NUMBERS AND THES GEOMETRIC REPRESENTATION As has already been seal, by a complex number we refer to an expression of the form a + ib, where A and B are real numbers and I is the imaginary unit. If c = a + ib, a is called the real part of C, written re c, and b is called the imaginary part of c, written im c. By the zero number complex, we refer to the number 0 = 0 + i0, with zero real and imaginary parts. By definition, two complex number C1 and C2 are equal if and only if im c = 0, c = a + ib is reduced to a real number, while if im c â ˆšâ ‰ ¥ 0, c it is said that it is Imaginary and if re c = 0, im c â ˆšâ ‰ ¥ 0, c It is said that it is purely imaginary.1 The complex number can be represented geomã © trically as points in the plane, a fact that does not only be ã igetil but virtually indispensable. Presenting a rectangular coordinate system in the plane, we can identify the complex number z = x + iy with point p = (x, y), as shown in Figure 1.1. In this way, we establish an unique correspondence between the set of complex number and the set of all points in the plane. Clearly, bass mapping, the set of all the real numbers corresponds to the x axis (hereinafter called a real axis) and the set of all the purely imaginary numbers to the x-axis (hence called the imaginary axis), while the set of all imaginary numbers corresponds to all points which do not lie on the real axis. Moreover, the complex number 0 corresponds to the point of intersection of the x-axis and y-axis, i.e., the origin of coordinates. The plane whose points represent the complex numbers is called the complex plane, or the z-plane, w-plane,¢ÂÂ¦Â, depending on the letter z, w,¢ÂÂ¦Âused to denote a generic complex number. With the understanding that such a complex plane has been constructed, the terms "complex number x + iy and point x + iy" will be used interchangeably. Another entirely equivalent way of representing the complex number z = x + iy joining the origin O of the complex plane to the point P = (x, y), instead of using the point P itself (see is called the modulus or absolute value of the complex number z, and is denoted by |z(considered positive if the rotation is counterclockwise and negative otherwise), is called the argument of the complex number z, and is denoted by Arg z.Ã²Â In other words, |z| and Arg z are the polar coordinates r and Ã¦Â of the point with rectangular coordinates x and y, i.e., FIGURE 1.1 It follows at once that where (1.5) is called the trigonometric form of the complex number z. Clearly, the quantity Arg z is defined only to within an integral multiple of 2ÃÂ. However, there is one and only one value of Arg z, say ÃÂ, which satisfies the inequality and we shall call ÃÂ the principal value of the argument z, written arg z. The relation between Arg z and arg z is given by where n ranges over all the integers 0, Ã±Â1, Ã±Â2,¢ÂÂ¦Â. It is an immediate consequence of Figure 1.1 and our definitions thatÃ³Â and Some care is required in inverting (1.6), since the arc tangent of a real number x, written Arc tan x, is only defined to within an integral multiple of ÃÂ. However, there is one and only one value of Arc tan x, say Ã±Â, which satisfies the inequality al ed agorr³Ârp al euq rala±Ães ebac ,etnatsbo oN .i airanigami dadinu al ed n³Äicacilpxe anu omoc ecudda es secev a euq ogol¡Ána le eneit 1 â = 2i n³Äicaler al ,euqofne etse noC rop nenifed es serap ed n³Äicacilpitlum y n³Äicida al euq sartneim ,2y = 1y ,2x = 1x is ol³Ãs y is selaugi nos)2y ,2x(y)1y ,lx(serap sod ednod ...,2y ,2x ,1y ,1x selaer soremºÃn ed sodanedro serap omoc)i airanigami dadinu al a rirrucer nis(sojelpmoc soremºÃn sol rinifed aÃrdop onu),8.1(y)7.1(rop odaiuG 4.opmac nu ed samoixa sol sodot necafsitas sojelpmoc soremºÃn sol ,sarbalap sarto nE .)senoicaralced satse racifireV(.1 = 1âzz euq lat z/1 = 1âz ocinºÃ osrevni nu eneit z ojelpmoc orec on oremºÃn reiuqlauc y ,0 =)zâ(+ z euq olpmeje rop- ocinºÃ ovitagen nu eneit z ojelpmoc oremºÃn reiuqlauc ,orec se serotcaf sol ed onu sonem ol rop is ol³Ãs y is orec se sojelpmoc soremºÃn sod ed otcudorp le ,s¡ÃmedA)n³Äicatumnoc nos n³Äicacilpitlum al y otepser le(euq nacilpmi)8.1(y)7.1(senoicaler sal ,sojelpmoc soremºÃn sert nos 3z y 2z ,1z iS rop sodad nos 2z y 1z ed etneicoc le y aicnerefid al euq sartneim rop nad es 2yi + 2x = 2z ,1yi + 1x = 1z sojelpmoc soremºÃn sod ed otcudorp le y amus al euq ed)]4.1(.fc[1 .ceS ed n³Äicpircserp al ed avired eS ARBEGLA XELPMOC .3 :acirt©Ãmonogirt amrof ne sojelpmoc soremºÃn setneiugis sol ratneserpeR .amelborP osac oyuc ne ,ovitagen laer oremºÃn nu aes z euq sonem a ,s¡ÃmedA y ,laer eje la otcepser noc socirt©Ãmis nos z sotnup sol ,etnemaivbO .z rop odatoned se soremºÃn sotse ed onu iS .)sorto ed sonu(sojelpmoc sodagujnoc o sojelpmoc soremºÃn sodagujnoc nos euq ecid es yi â x y yi + x sojelpmoc soremºÃn soL .odala±Ães ah es ay omoc ,odanimretedni se)0 = y = x ,riced se(0 = z osac le euq sartneim etnemaralc somenet ,otinifni evleuv es x/y odnauc ,s¡ÃmedA odneinetbo),6.1(n³Äicaler al ritrevni somedop arohA .x nat otircse cra ,x ed cra etnegnat led lapicnirp rolav le ±Ī a someramall number to the complex numbers is not more mysterious that the extension of the integers to the rational number, and less complicated than the extension of the rational numbers to the real numbers.5 Figure 1.2 geomã © trically, the addition of two complex children Z1 and Z2 corresponds to the addition of the vectors that represent them [see Figure 1.2 (a)]. Similarly, the difference Z1 â € "Z2 is represented by the vector that joins point Z2 to point Z1 [see Figure 1.2 (b)]. It follows that ï (ZL, Z2), the distance between the two points Z1 and Z2, equals the mó dadulo of the nºMero complex z1 â € "z2: then the familiar fact that the length of one side of a cannat triam It exceeds the sum of the lengths of the other two sides implies the following two inequalities that imply complex numbers: the relationship (1.9) can be immediately generalized to the case of complex number: in (1.9), (1.10) and (1.11), Equality occurs if and only if all complex numbers (not zero) have the same argument. We observe that according to (1.8), if z = x + iy, then and therefore and to give a geomide interpretation of the multiplication and division of two complex numbers Z1 and Z2, first we write z1 and z2 in a trigonomã © trica form [cf. (1.5)], that is, where then, according to (1.8), and therefore the last fion ARG Z2 value. Thus, the geomism interpretation of the multiplication of Z1 by Z2 (Z1 âˆ š 0, Z2 ð¹ 0) is as follows: Draw the vector Z1 (with an initial point at the origin), multiply its length by the tencionz2 factor inhabitants , 6 and rotate the resulting vector in the opposite direction through the arg z2 Ë¡ s. Similarly, if Z2 âˆ š 0, it is very clear that with a corresponding geomism interpretation of the division. It is followed from the second of the fesles (1.13) that arg (z1/z2) The rush between the vectors Z2 and Z1 measured from Z2 to Z1 in the direction. Problem 1. Calculate the following expressions: Problem 2. Calculate Problem 3. Find the complex numbers which are conjugate to a) their own squares; b) their own cubes. Ans. b) 0, 1, i, ¢ÂÂÂ1, ¢ÂÂÂi. Problem 4. Suppose a complex number u is obtained as a result of a finite number of rational operations (i.e., addition, subtraction, multiplication and division) applied to the complex numbers z1, z2,¢ÂÂ¦Â, zn which is the complex conjugate of u. Problem 5. Defining rational numbers as ordered pairs of integers, write the corresponding rules for addition and multiplication of rational numbers. Verify that addition and fhultiplication are commutative and associative, and that multiplication is distributive with respect to addition. Problem 6. Prove the inequalities algebraically. Problem 7. Prove the identity and interpret it geometrically. Problem 8. By a purely geometric argument, prove that Problem 9. Solve the following equations: Problem 10. Prove that every complex number (except ¢ÂÂÂ1) of unit modulus can be represented in the form where t is a real number. Problem 11. Prove that Problem 12. Prove that if |z1| = |z2| = |z3|. Problem 13. Find a necessary and sufficient condition for three distinct points z1, z2 and z3 to lie on the same line. Problem 14. Suppose the points z1, z2,¢ÂÂ¦Â, zn all lie on one side of a line drawn through the origin of the complex plane. Prove that the same is true of the points 1/z1, 1/z2,¢ÂÂ¦Â, 1/zn. Moreover, show that Problem 15. Prove that if z1 + z2 + z3 = 0 and |z1| = |z2| = |z3| = 1, then the points z1, z2 and z3 are the vertices of an equilateral triangle inscribed in the unit circle |z| = 1. Problem 16. What are the loci of the points z which satisfy the following relations: Problem 17. Describe the families of curves in the z-plane with equations where C is an arbitrary real number. 4. POWERS AND ROOTS OF COMPLEX NUMBERS Let n be a positive integer and z a complex number. By the fare of Z, written zn, we refer to Z multiplied by himself, as in the case of real numbers. If z = 0, obviously we have zn = 0. If z â € ° 0, then, configuring and applying repeatedly (1.12), we find that when r = 1, (1.14) and (1.15) together they imply the following fórmula, known as De Moivre's theorem: using the binomial theorem to expand the left side of (1.16) and equating real and imaginary parts of the resulting equation, we can express custom or pec Licente and sin. For the same algebraic reasons as in the case of real numbers, we define the formulas (1.15) and (1.16) are life for all integers n = 0, â ± 1, â ± 2, ã ¢ â,¬la. ... Next, we consider the problem of extracting the ram from a complex number. Again, be a positive integer and z a complex number. Then, by the Enã © Sima Raãz de Zor Zã ¢ â¹/n, we refer to any complex number ã®â¶ that satisfies the equation if z = 0, obviously we have ã®â¶ = 0. If z â € 0 , then, establishing that you follow it, follow it. Â · and, that is, therefore, we have to be clear from (1.17) that the arg z values that differ in 2kã¯ â,¬, where k is an integer not divisible by n. Consequently, when arg z is executed through the values that we obtain n. Since any other ARG Z value differs from one of the number (1.18) by a multiple of 2nã¯ â,¬, these are exhausted all the possibilities. Therefore, the Enã © Sima Raãz of Z has different values (if z equal to is called the main value, since z coincides with the positive raism of Z (cf. footnote 7, p. 10) . It is deduced from the formula that can be obtained from the main value multiplying this last one by the different roots of the unit. We finally define an arbitrary rational power of a complex number by the formula where m and n> 0 are integer primary Then we have where | z | M/n Problem 1. Calculate the following quantities: Problem 2. Show that problem 3. Use Moivre's theorem to express cos 5 ', cos 8ã®â¦, without 6ã® ... ... roP .F y E sotnujnoc sol ed onu sonem la setneicenetrep sotnup ed otnujnoc la somirefer son ,F F E otircse ,F y E stes sod ed n³Äinu al roP .na ,...,1a nos sorbmeim soyuc otnujnoc la somirefer son }nu ,...,1a{ rop ,etnemlareneg s¡Ãm y ,se orbmeim ocinºÃ oyuc otnujnoc la somirefer soN .0 Ù E is oÃcav se on E otnujnoc nu euq ecid eS .orec oremºÃn le ratoned arap azilitu es euq 0 olobmÃs omsim le rop oÃcav otnujnoc le somatoned y ,otulosba ne sotnup eneitnoc on euq otnujnoc la somirefer son oÃcav otnujnoc le roP . sodot ,riced se ,)F ed otnujnocbus le ne odinetnoc ¡Ãtse E o ,F ne eyulcni es E ,omin³Ãnis(F ed otnujnocbus nu se E otnujnoc le euq acifingis)E â F o(F â E roP .E a ecenetrep on z euq acifingis E â z y ,)E ne odinetnoc ¡Ãtse z o ,E ed orbmeim nu se z ,omin³Ãnis(E otnujnoc la ecenetrep z euq acifingis E â z ,otnat ol roP .aÃroet al ed radn¡Ãtse n³Äicaton y aÃgolonimret someraelpmE .onalp le ne sotnup ed sotnujnoc soirav ed oidutse la etnelaviuqe ¡Ãres sojelpmoc soremºÃn ed sotnujnoc soirav ed oidutse le otnat ol rop y ,sojelpmoc soremºÃn ed ralbah la ocirt©Ãmoeg ejaugnel le somerazilitu ,aroha ed ritrap A SAXELPMOC SENOICNUF .aÃroet al ejeD .5 .1ânz = z sojelpmoc soremºÃn sol sodot rartnocnE .9 amelborP .dadinu al ed zÃar atn anu se µÎ edn³Ãd raluclaC .8 amelborP .]1 =)n ,m(,riced se[somirp etnemavitaler nos n y m is ol³Ãs y is nedicnioc n/1)mz(y m)n/1z(serolav ed sotnujnoc sol euq rartsomeD .n y m ed nºÃmoc rosivid royam le se)n ,m(ednod ,sotnitsid serolav)n ,m(/n eneit m)n/1z(= n/mz euq rartsoM .soretne sod reiuqlauc res 0 â n dna m teL .7 amelborP ?otse aserpxe ocirt©Ãmoeg ohceh ©ÃuQ¿Â .orec se dadinu al ed satnitsid htn secÃar sal sadot ed amus al euq raborP .6 amelborP :secÃar setneiugis sal ed serolav sol sodot artneucnE .5 amelborP .Ð nat ed sonimr©Ãt ne Ð 6 nat raserpxe arap ervioM eD ed ameroet le esU .4 amelborP .Ð nis dna Ð soc ed sonimr©Ãt ne seulav sti dna f noitcnuf eht neewteb hsiugnitsid dluohs eno ,gnikaeps yltcirtS .E oinimod la aticÃlpxe aicnerefer somitimo odunem a ,n³Äisufnoc ed dadilibisop yah on odnauc ,ohceh eD omoc ,etnemelpmis s¡Ãm osulcni ,o adaiverba amrof ne)02.1(ribircse somedop n©ÃibmaT .z ne f ed serolav sol sodot ed otnujnoc le ratoned arap z otnup le ne f ed rolav reiuqlauc ratoned arap)z(f somazilitu ,sosac sobma nE .z otnup le ne f ed rolav nu amall es f ne odinetnoc ¡Ãtse)w ,z(euq lat w adac y ,elpitlºÃm rolav ed se f euq ecid es ,oirartnoc ol eD .z otnup le ne w rolav le noc ,olos nu arolav es euq ecid es f secnotne ,z orbmeim remirp omsim le noc)w ,z(serap sod eneitnoc on f iS .f ed ognar le amall es f n³Äicnuf al ed)n³Äicinifed ed(oinimod le amall es E otnujnoc lE .z noc sodaicosa sojelpmoc soremºÃn)soirav etnemelbisop(sol ed onu se zw euq razitafne arap evris etnemelpmis y ,odunem a ¡Ãritimo es zw ne tpircsbus lE . zw ,E airebI z ednod)zw ,z(amrof al ed sodanedro serap sotnitsid nos sorbmeim soyuc otircse ,otnujnoc nu a somirefer son f n³Äicnuf anu rop y , E soÃcav on sotnujnoc sod sodaD .²Ð ,Ð½Ð°ÐÑ ¾Ð½Ð F , saicnanag E sotnitsid sotnujnoc ed rap reiuqlauc arap 0 = F ©â E is)ranumocsed etnemelpmis o(odaerap lanumocsed nos euq ecid es £Ð ne sotnujnoc soL .etnemavitcepser natoned es ¾Ð³Ð ne sotnujnoc sol sodot ed n³Äiccesretni al y n³Äinu al ,otnujnoc lat se £Ð iS .sotnujnoc somsim solle nos sorbmeim soyuc legn¡Ã ed sotnujnoc raredisnoc edeup n©ÃibmaT onU .n³ÄicavresbO ,.e.i F a necenetrep on euq E ne sotnup ed otnujnoc la somirefer son ,F y E stes sod ertne F â E aicnerefid al roP .E a necenetrep on euq)ojelpmoc onalp le ne(sotnup sol sodot ed otnujnoc la somirefer son ,cE otircse ,E otnujnoc nu ed otnemelpmoc le roP .sotseupmocsed n¡Ãtse euq ecid es ,0 = F ©â E euq selat nos euq ,riced se ,aÃcav ¡Ãtse n³Äiccesretni ayuc F y E sotnujnoc soD .F y E a setneicenetrep sotnup ed otnujnoc la somirefer son ,F ©â E otircse ,F y E sotnujnoc sod ed ed ed 1 â f osrevni le roP .serolav sus omoc n³Äicnuf al otnat z etoned ot)z(f esu ot yramotsuc si ti ,noitaton deifilpmis siht fo krowemarf eht nihtiw tub ,z tniop eht ta yroeht elohw eht taht raelc si ti ,suhT .E no noitcnuf xelpmoc elgnis a gninifed ot tnelaviuqe si E no)12.1(snoitcnuf laer owt gninifed ,ylesrevnoC .y dna x selbairav laer owt fo noitcnuf a hcae ,E no snoitcnuf laer owt gninifed ot tnelaviuqe si e tes a no)z(f = w)z(f = w noitcnuf xelpmoc elgnis a gninifed ,xelpmoc si vi + u = w erehw esac lareneg eht .y DNA x srebmun laer fo riap eht htw u rebmun laer eht gniaicossa ot tnelaviuqe yi + x = z rebmun xelpmoc eht ht h rebmun laer eht gned ,tcaf ni .Y DNA X Selbairav Laer Wowt fo noitcnuf laer a sa dedrager eb nac elbaairach a fo noitcnuf ruo neht .0 = V ,u = w ,i Era Noitcnuf Eht fo Seulav eht lla Nehw Srucco Tseretni Fo esac laiceps a .Elbairav xelpmoc a fo noitcn a fo noitcnuf a EB ,yi + x = z dna vi + u = w erectes Eb ot otmussa eb llew noissuicsid rednu rednustcnuf lla ,detats ylticilpxe you yratnoc eht sselnu ,no won morf ,revewoh .sdeen erutuf fo noitapicitna ni elbairav xelpmoc a fo n oitcnuf deulav-elpitlum a fo noiton eht decudortni evah eW .2 krameR .noitcnuf xelpmoc a)z(f gnillac yb tcaf siht ezisahpme semitemos ew ,srebmun laer sa llew sa yranigami sniatnocelbairav xelpmoc a fo noitcnuf a sa)z(f = w noitcnuf eht ot gnirrefer yb tcaf siht ezisahpme semitemos ew ,srebmun laer sa llew sa yranigami sniatnoc E niamod eht fI .elbairav tnedneped eht fo seulav eht dellac netfo eraelbairav tnednepedni eht fo seulav eht dellac netfo era E fo stniop eht , E niamod htiw)z(f = w noitcnuf a nevig .1 kramer .)w(f/1 lacorpicer eht etoned ot desu eb reven llew)w(1â"â€Ã¢ F ,noisufnoc diova ot sa ylpmis ot sa ylpmis ro mrof detaivebba eht ni sa 1â€ Ã¢ f etirw nac ew ,f noitcnuf eht fo noissuicsid ruo gnilellarap .f noitcnuf lanigro eht fo egnar eht e eehw ,e egnar dna f ,ylsuoivbo .f âˆâˆÃ¢)W ,Z(and ylno DNA and 1â". â€Ã¢ F âˆâˆÃ¢)Z ,W(,.e.I ,redro esrever nittirw f ni sriap Deedro eht lla fo gnitsnoc tes eht naem ew)02.1(YB Nevig f noitcnuf The functions of a complex variable Z can be interpreted in terms of pairs of real functions of two real variables x and y, and sometimes we will use this interpretation. EXAMPLE 1. The complex the unique function corresponds to the two real functions Example 2. The two real functions correspond to the complex the unique function if f (z) is an unique value function with the domain E, the point w = f (zis called the image of the point z ã ¢ ë † ë † e [under f (z)]. In the same way, if d Å¡ e, the set of all points w = f (z) such that z ã ¢ ë † ë ë Lat D Mapeo on. Therefore, each mapping is a mapping in the mapping, but not on the contrary. A mapping of a set in itself is often called transformation. If f (z) has only one value, the function Inverse of 1 (w) in general, it has a mostal value. If f ãgn z ã ¢ ë † ë † e which is the image of the point w under f â,¬-1 (w) is called an image in V versa or preimagen of W [under f (z, the set of all po ints z = f â,¬-1 (w) so that w is called a reverse or preimagen image, denoted by f). It is said that a one -to -one function f (z) establishes a one -to -one correspondence, between the z points in its domain and the points W in its range. Observation. In the case of functions, images and inverse images of mãºltiple value they are defined naturally. For example, if f (z) take several values at a given point z ã ¢ ë † ë † e, each of these values is called the image of point z. Similarly, if there are several points z ã ¢ ë † ë † e such that f (z) = w, where w, then each of the points z is called a reverse image of w. In terms of definition (1.20) of a function, the images of a given point z ã ¢ ë † ë † e are all those points that appear Algéºn tidded torque (z, w) with z as his first member, member, The inverse images of a given point W Iberia are all those points Z appear in an orderly pair (Z, W) with W as their second member. Problem 1. Let âˆ 'be a set whose members are themselves. Testing relationships where D is an arbitrary set. Try the of Morgan and specialize these phones in the case in which D is the entire complex plane. Problem 2. A finite set is understood a set consisting of a finite number of elements, and by an infinite set a set that is not finite is understood. (The empty assembly is considered finite). It is said that two games are equivalent if a correspondence can be established between them. It is said that a set is accountably infinite if it is equivalent to the set of all positive integers. An accounting set is understood a finite set or an accounting set. A set that is not accounting is said to be countless. Prove that a) The set of all rational number is accounting; b) The set of all real number is countless; c) Any subset of an accounting set is accounting; d) The union of many accounting sets is accounting. 6. Complex issues allow me to be the set of all positive integers 1, 2, ... then any complex function of the ignic value f (z) with domain i is called an infinite sequence (of complex numbers,) or simply a sequence (complex), and the values zn = f (n) are called the terms of the sequence. The sequence in Sã is usually denoted by enumerating its terms to increase the ours , ... kn, ... it is a sequence of positive integers such that Kn ™ Kn+1 for all n = 1, 2, ... then the corresponding terms of the sequence {zn,} i.e, ZK1, ZK2, ... ZKN, ... forms a new sequence {zkn,} called a subsequence of ,1n ,1n ednod },knz{ etnemeverb o ...,nz ...,2z ,1z amrof al ne ribircse nedeup es n©Ãibmat }nz{ ed saicneucesbus saL .n³ÄicavresbO .}nz{ aicneuces al ed saicneucesbus sal sadot nos saicneuces sal ,olpmeje roP .}nz{ aicneuces Aivija pogro Sate talone, Ayned * daã é when I mã ésistu , kÃ mói ké ké kÃrock, , tub: > nallalat Sé ãso rie syubants, mötrióy 4yan mötobbɔ: Quanh) Questions game: Remtome think of salagates and salubesy mötubói lames méram mötubézan mbɔ lames, tabone Quank- Sin, Augal : - A- Quee Peyu salugan salm lame sabɔmemee for Doubégéra éck , Rombé- ..t. , Savit Suan, mégra möto mé mötocloo syole tlek . , srowon Fighte Feketry .. K Kn

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