

Station 3: Solving Quadratic Equations

Part A: Complete each problem by FACTORING.

1. Find the real zeros of $f(x) = 2x^2 + 15x + 18$.

$$0 = 2x^2 + 15x + 18$$

$$0 = (2x + 3)(x + 6)$$

3. Solve $9x^2 - 10x = 2x + 5$.

$$x = -\frac{6}{11} \text{ or } -\frac{5}{9}$$

$$9x^2 - 12x - 5 = 0$$

$$(3x - 5)(3x + 1) = 0$$

$$x = -\frac{1}{3} \text{ or } \frac{5}{3}$$

2. Solve $245x^2 - 405 = 0$.

$$+1x^2 - \frac{9}{5} = 0$$

$$(7x + 9)(7x - 9) = 0$$

$$x = \pm \frac{9}{7}$$

4. A box has a base that measures 3 inches by 5 inches, and a height of 11 inches. Increasing each dimension of the base by the same amount causes the volume of the box to increase by 528 cubic inches.

- a. Using x as the amount that each dimension of the base is increased by, write an expression for the volume of the box. Let x be the increase in each dimension of the base in inches.

$$11(3+x)(5+x)$$

- b. Use the original measurements and the expression you wrote in part (a) to write an equation that can be used to find the amount by which each dimension of the base increased.

$$(3)(5)(11) + 528 = 11(3+x)(5+x)$$

- c. Solve the equation in part (b) and interpret the solutions in the context of the problem.

$$3 \cdot 5 \cdot 11 + 528 = 11(x+3)(x+5)$$

$$3 \cdot 5 + 5 = (x+3)(x+5)$$

$$15 + 5 = x^2 + 8x + 15$$

$$x^2 + 8x - 48 = 0$$

$$(x+12)(x-4) = 0$$

$$x = -12 \text{ or } 4$$

Each dimension of the base is increased by 4 in.

Part B: Complete each problem.

5. Consider $9x^2 - 12x + 98 = -50$.

- a. Determine how many and what type of solutions the equation has.

$$b^2 - 4ac = (-12)^2 - 4(9)(98) = 144 - (36)(98) < 0$$

2 imaginary solutions

- b. Find those solutions by completing the square.

$$9x^2 - 12x + 98 = -50$$

$$9x^2 - 12x = -148$$

$$x^2 - \frac{4}{3}x = -\frac{122}{9}$$

$$x^2 - \frac{4}{3}x + \frac{4}{9} = -\frac{122}{9} + \frac{4}{9}$$

$$(x - \frac{2}{3})^2 = -\frac{118}{9}$$

$$x - \frac{2}{3} = \pm \frac{\sqrt{118}}{3}$$

$$x = \frac{2}{3} \pm \frac{\sqrt{118}}{3}$$

6. A rocket is shot into the air from a 168-foot-high platform with an initial velocity of 68 feet per second.

- a. Use the quadratic formula to determine how much time the rocket is in the air before landing at ground level.

$$h(t) = -16t^2 + 128t + 168$$

$$t = \frac{-128 \pm \sqrt{128^2 - 4(-16)(168)}}{2(-16)} = -1.5 \text{ or } 7$$

the rocket landed after 7 seconds

- b. Could the factoring method have been used to answer the question above? Explain.

Yes, because solutions are rational

For HW, complete Part 2 of the review packet.

Algebra Nation Answers Section 5

A Gutmann



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College Algebra Richard N. Aufmann, Vernon C. Barker, Richard Nation, 2001-06-06 The Fourth Edition of College Algebra continues to promote student success by engaging students in mathematics thus helping them see the dynamic link between concepts and applications The authors hallmark approach the Aufmann Interactive Method encourages students to interact with math by presenting an annotated example then guiding students with a Try Exercise and finally presenting a worked out solution for immediate reinforcement of the concept A wealth of new features designed to enhance learning include more in text guidance as well as special web based resources and an unparalleled Instructor s Annotated Edition facilitates teaching New An Instructor s Annotated Edition unlike any other offered for this course features reduced student text pages with special instructor resources in the margins teaching tips extra examples ideas for reinforcing concepts discussion suggestions highlighted vocabulary and symbols challenge problems quizzes suggested assignments and references to transparencies that may be found both in the Instructor s Resource Manual and on the web site New Side by Side Solutions to examples pair an algebraic solution and a graphical representation to accommodate different learning styles New Technology dependent modeling sections introduce the idea of mathematical modeling of data through linear quadratic exponential logarithmic and logistic regression New Integrated web resources include selected Take Note boxes identified by a special web icon which direct students to an interactive example or a downloadable file on the web site These special resources can be used by instructors for presentation purposes or can be assigned to students to help them visualize a concept New Concept Lists now prominently feature all the major topics at the beginning of each section preparing students for the concepts to follow A wide range of applications exercise sets and supplemental exercises many involving real data encourage problem solving skill building group work writing and manipulation of graphing calculators Exploring Concepts with Technology a special end of chapter feature expands on ideas introduced in the text by using technology to investigate extended mathematical applications or topics Projects at the end of each exercise set are designed to encourage students or groups of students to research and write about mathematics and its applications Additional Projects are included in the Instructor s Resource Manual and on the book s web site Topics for Discussion conceptual exercises included at the end of each section can be used for discussion or writing assignments Take Note and Math Matters formerly called Point of Interest margin notes alert students about interesting aspects of math history applications and points that require special attention

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principles to the dismissal of free speech the nuclear family and American sovereignty as outdated outmoded and out of touch This book delves into what is being taught in schools today and why *Men, Machines, and Modern Times, 50th Anniversary Edition* Elting E. Morison, 2016-08-26 An engaging look at how we have learned to live with innovation and new technologies through history People have had trouble adapting to new technology ever since perhaps the inventor of the wheel had to explain that a wheelbarrow could carry more than a person This little book by a celebrated MIT professor the fiftieth anniversary edition of a classic describes how we learn to live and work with innovation Elting Morison considers among other things the three stages of users resistance to change ignoring it rational rebuttal and name calling He recounts the illustrative anecdote of the World War II artillerymen who stood still to hold the horses despite the fact that the guns were now hitched to trucks reassuring those of us who have trouble with a new interface or a software upgrade that we are not the first to encounter such problems Morison offers an entertaining series of historical accounts to highlight his major theme the nature of technological change and society s reaction to that change He begins with resistance to innovation in the U S Navy following an officer s discovery of a more accurate way to fire a gun at sea continues with thoughts about bureaucracy paperwork and card files touches on rumble seats the ghost in Hamlet and computers tells the strange history of a new model steamship in the 1860s and describes the development of the Bessemer steel process Each instance teaches a lesson about the more profound and current problem of how to organize and manage systems of ideas energies and machinery so that it will conform to the human dimension House documents ,1887

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