School Districts Say ...

“The Algebra Survival Guide and the Algebra Survival Guide Workbook are being used by our ENTIRE DISTRICT, and the teachers love it! It uses a student-friendly format that takes the fear out of learning algebra.”

— Susan Metcalfe
Secondary Math Coordinator
Pasadena (TX) Independent School District

“The Memphis City Schools purchased Algebra Survival Guides and Algebra Survival Guide Workbooks for all of our teachers because these books provide clear explanations and practice opportunities for many topics that are often the most difficult for Algebra 1 students to understand.”

— Joan Cox
Mathematics Facilitator
Memphis City Schools, Memphis, TN

“PRAISE for the Algebra Survival Guide (and Workbook)”

Reviewers Say ...

“We give the Algebra Survival Guide our highest Four-Star ‘Awesome!’ Rating. The author did a great job with this book, and the illustrations are excellent.”

— The Washington Times

“Thank you for writing such a wonderful, easy-to-learn and fun-to-read algebra book! I used your book to help me with studying algebra for the GED test. Now I am in college, and I use your book as a supplement to my algebra textbook. Your book has helped me tremendously.”

— Jasmine Girard, Hillsborough, NC

Adult Students Say ...

“I’m a returning college adult, now in week four of my College Algebra course. Your book has finally filled in the gaps in my earlier education. Thank you to the third power! Thirty years of math phobia gone in three hours of reading.”

— Mary Ellen Killian, Lake Oswego, OR

“I decided to go back to college to get my degree, but the furthest I ever got in math was basic arithmetic. Then I bought the Algebra Survival Guide. Your clear, concise explanations are unmatched by any other publisher, and I know this to be true from the many math books I have purchased. Now I find algebra easy! I never thought I would say that!”

— Alicia Harter, Santa Rosa, CA

“This book will teach algebra to anyone who unleashes its power — especially daunted parents and weary teachers.”

— Northwest Family Magazine

“This book is fun to handle and stunning to read ... It is a friendly book that demystifies algebra and — believe it or not — even makes it fun.”

— Kern County Family Magazine

“Last time I had algebra I was in high school. I didn’t like it, and it was a long time ago. I had to go back to the absolute beginning basics, and this book really helped. Its playful tone makes it much more approachable than the deadly dry textbook. Get the Algebra Survival Guide Workbook too.”

— G. Weber, Pittsburgh, PA (Amazon.com review)
The girls in my school are using the Guide because it helps them understand algebra and feel confident. I would definitely say that the format of the Guide has helped these girls overcome their anxiety about math.
— Sarah Pearce, Directress, Milwaukee Montessori School

Delightful self-paced book that is sure to help those with math anxiety!
— Linda Day, Ph.D., Director of the UNM / Santa Fe Public Schools Teacher Education Program

The Algebra Survival Guide speaks to students in a language they can understand. I’ve already asked my school to order copies for our library.
— Mary Gambrel, 7th grade regular and honors math teacher at Travis Middle School, Amarillo, Texas

Everything you always wanted to know about algebra -- and MORE -- written in a style that anyone can understand. I recommend this book to teachers, students and parents.
— Eleanor Ortiz, President of the New Mexico State Board of Education, and one-time algebra teacher herself

I like the Guide so much that at Parents Night I copied the book’s order form and gave it out to all the parents of my students.
— Linda Barkley, math teacher, Sacred Heart School, Dearborn, MI

“Your book is wonderful! I was concerned that with my rusty algebra skills I was not going to be able to help my eight grader this year, but your book is bringing all the material back to mind, and with much better explanations than I remember getting years ago!”
— Maureen McCardy, Camarillo, CA

“My eight-year-old, homeschooled son is devouring your book. Thank you so much; I am not a "math person," but we are having a blast with this together!”
— Lew Feldner, Gilbert, AZ

I had a difficult time helping my son when he became confused by algebraic concepts. I purchased your book and we are now really learning algebra! We’re sailing through your Survival Guide, working for at least an hour each night — and having FUN.”
— Ginny Krauskopf, Round Rock, TX

Kids could learn math without a teacher using this book!”
— Celeste Due, soon-to-be-famous 12th grader, Santa Fe, New Mexico

“I would definitely tell friends about the Algebra Survival Guide because if they’re having a much trouble as I’ve had, I know they’d benefit from it as much as I did.”
— Nick Fabin, 9th grader at the Colorado Rocky Mountain School, Carbondale, CO

“I want to thank you because my school just loves your book! I have switched over from my old textbook to the Algebra Survival Guide, and now my friends are going to do it too.”
— Alia Triliegi, 8th grader at Milwaukee Montessori

Yes! I bought the Algebra Survival Guide to help my public schooled daughter with concept review for SATs, but it really helped me too! I plan to use it for my other daughter too!”
— Becky Fisher in Delaware
Algebra Survival Guide
A Conversational Handbook for the Thoroughly Befuddled

Written by Josh Rappaport
Illustrated by Sally Blakemore

Singing Turtle Press
Santa Fe, New Mexico
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EMERGENCY FACT SHEET POSTER
Algebra Wilderness “Bored” Game
Hello and welcome!

You’re trapped in a classroom. People are talking in what seems to be a foreign language.

Gibberish about exponents, variables, monomials, the Pythagorean theorem.

They expect you to “get it.” And there’s a test on all this stuff tomorrow! You are in danger of perishing at your very desk.

It’s only a matter of time...

Thank goodness you just discovered the Algebra Survival Guide.

This guide, written by someone who, long ago, barely crawled out of the Algebra Wilderness alive, will help you find your way through this perilous territory.

But now that you have the Guide, how do you use it?

Just flip the page to find out!
What is algebra?

Algebra is a branch of math that performs a magic trick — it takes something that’s **unknown** and - poof! - turns it into something **known**. Algebra does this by:

- **a)** using letters (**variables**) to stand for **mystery numbers**, and
- **b)** giving you a **process** to let you discover the value of the variables.

**Simple example of an algebra problem**

Joan has an **unknown** amount of money in her purse. If Joan had $5 more, she would have $100. **How much money does Joan have?**

Using algebra, you’d work out the solution like this:

Let the variable, \( j \), stand for the amount of money **Joan** has. Since Joan would have $100 if she had five dollars more,

\[
\begin{align*}
  j + 5 &= 100 \\
  j &= 100 - 5 \\
  j &= 95
\end{align*}
\]

meaning: Joan has **$95** in her purse.

Seems simple? Don’t worry ... in a little while, you’ll be challenged by problems like this: **Two trains start heading toward Amityville at the same time. One’s coming down from the north at 100 mph; the other is steaming up from the south at 150 mph. If it takes the trains three hours to reach Amityville, how far apart were they when they started?**
Q: What does the reflexive property say?

A: The reflexive property tells you this simple truth:

\[ a = a \]

Or, in plain English: any quantity is equal to itself.

Examples of the reflexive property

- \( 2 = 2 \)
- \( \frac{1}{3} = \frac{1}{3} \)
- \( .8 = .8 \)
- \( ms = ms \)
- \( x^2 = x^2 \)
- \( ac^x = ac^x \)

Which of the following statements gives an example of the reflexive property?

a) \( a = b = c \)
b) \( b = b \)
c) If \( a = a \), then \( b = b \).

Teachers will often give you quizzes on these different properties. So it helps to have a way to remember them. These pages will help you remember the properties by making a connection between the property’s name and what it means.

So how can you remember why this is called the “reflexive property”? It’s because the reflexive property deals with a reflection. Just as you always see yourself when you look at your reflection in the mirror (well, at least on good days!), a number or variable sees itself when it looks in the mirror of the equal sign.

check out Josh’s "Mathchat" blog
Q: Why do I need to learn about these different sets of numbers? Aren’t all numbers just numbers?

A: Up till now, you’ve probably viewed all numbers as “just numbers.” But beginning with algebra, you start to look at numbers in more sophisticated ways. The names for the sets of numbers, which you’ll learn in this section, will become your new vocabulary for talking about numbers with greater understanding.

Think about it ... Way back when you were in third or fourth grade, you probably paid little attention to the various groups of kids in junior high or high school. But when you got to junior high or high school, you noticed that various people dressed and acted in different ways. And eventually you “learned the ropes”; you realized that some kids were viewed as “jocks,” others as “brains,” still others as “preppies,” “skaters,” etc. In the same way, you probably viewed all numbers as “just numbers” in early math because you didn’t need to know any better. But when you study algebra, you find out that not all numbers are alike. Just like people, they can be viewed by the groups they belong to, and numbers from different groups behave differently. Distinguishing types of numbers may seem hard, but with a little practice you’ll be able to spot the difference between an irrational number and an integer as quickly as you can pick out a “skater” from a “preppie.”
First of all, what exactly is a negative number? And is there any way to relate negative numbers to my everyday life?

Q:

A:

Negative numbers are numbers with negative signs, which means they have a value less than zero.

“But wait,” you say, “how can any number have a value less than zero? Isn’t zero the lowest value possible?”

To get a grip on this idea, consider the meaning of a debt — an amount of money you owe someone. Suppose you have seven dollars in your pocket; it’s as if your financial status is +7. But now suppose you’ve spent your seven dollars. You have nothing left, but at least you don’t owe anyone any money; now you can view your financial status as 0. Finally imagine that you borrow seven dollars from someone; at this point, your financial status is −7. In other words, negative seven is seven less (or here, worse) than 0.

The same idea pops up with temperature readings. A temperature of positive 10 degrees means 10 degrees above 0. But a temperature of negative 10 degrees means 10 degrees below 0. In other words, freezing! Here too, you see that in real life you do have a concept of negative numbers, numbers with values less than zero.
Simplify using the order of operations:

a) $5 \cdot 4^2$
b) $3xyz - 9xyz$
c) $2\left\{6 + \left\{(4 + 2) \div (3 - 1)\right\}\right\}$
d) $-3a + 4b - 12a - 6b$
e) $(7 - 3) \cdot (8 - 6)$
f) $-(a - 3 - 6y + b)$
g) $-3x^2 - 7x^2 - 4x^2 - 2x^2$
h) $5^2 - 2^2 + (-3)^2$
i) $40 \div 8 \cdot 2$
j) $16 - 12 + 4$
k) $-9pq + 12pq$
l) $6 \cdot 9 + 27$
m) $+ rs + rs + 2rs + 3rs$
n) $+ 6uv^2 - 11uv^2$
p) $(2 + 1) \cdot (2 + 5) + -4$
q) $-x + 4p - 7x - (-6p)$
r) $6 - (x - 2)$
s) $7\left\{(3 + 2) \cdot 4\right\}$
t) $3\left\{2 + \left\{(18 + 2) + 3\right\} + 3\right\}$
u) $9vr - (-3vr) - (+5vr)$
v) $2^2 + 2 + 6^2 \cdot 1 - (3 + 6)^2$
w) $6 \cdot 9 + 27$

Answer true or false:

x) $4b + 2b = 6b$
y) $- (b - 3) = -b - 3$
z) $-5^2 = (-5)^2$
A) $4a^2b$ and $3a^2b$ are like terms.
B) $10x/2x = 5x$
C) $4 + 2 \cdot 3 = 18$
D) $3x^2 = (3x)^1$
E) $a'b$ and $b'a$ are like terms.
F) $4x \cdot 2x = 8x$
G) $4 + 2 \cdot 3 = 10
Simplify these expressions using the rules for working with absolute value.

\[
\begin{align*}
\text{a) } & \quad -9/10 \\
\text{b) } & \quad 6 - |4 - 11| \\
\text{c) } & \quad -5 - |3 + 8| \\
\text{d) } & \quad 4/20 - 4 \\
\text{e) } & \quad (|5| - 5)^2 \\
\text{f) } & \quad -19 + |13 - 2| \\
\text{g) } & \quad 21/7 + 6 \cdot 2 \\
\text{h) } & \quad -1 - 1 \\
\text{i) } & \quad 6 - |+15| \\
\text{k) } & \quad 3 \cdot |2 - 12| \\
\text{l) } & \quad 14 + |16| \\
\text{m) } & \quad 24 - 9 + 3 \\
\text{n) } & \quad 8 - |12 - 3| \\
\text{p) } & \quad 13 - |-5| \\
\text{q) } & \quad -17 + 24 \\
\text{r) } & \quad -0.0001 \\
\text{s) } & \quad +10 \\
\text{t) } & \quad 8 - (|2|)^2 \\
\text{u) } & \quad (-2) \cdot [(11 + 7) + 9] \\
\text{v) } & \quad 8 \cdot |-6| \\
\end{align*}
\]
Is there a larger lesson to be learned from the fact that

\[
a^{-x} = \frac{1}{a^x}
\]

and that

\[
\frac{1}{a^{-x}} = a^x
\]

\[Q:\]

Actually there is a big lesson, and it is this:
Whenever you push an exponential term across the fraction bar, the exponent’s sign changes. If the exponent’s sign was positive, it becomes negative; if its sign was negative, it becomes positive. Below are illustrations of this idea.

**exponent’s sign changes from negative to positive**

- \(\frac{5a^{-3}}{7} = \frac{5}{7a^3}\)
- \(\frac{1}{2c^{-4}} = \frac{c^4}{2}\)
- \(\text{popsicle}^{-2} = \frac{\text{lollipop}^5}{\text{popsicle}^2}\)

**exponent’s sign changes from positive to negative**

- \(\frac{8x^4}{11} = \frac{8}{11x^4}\)
- \(\frac{1}{6w^3} = \frac{w^3}{6}\)
- \(\frac{\text{popsicle}^4}{\text{lollipop}^3} = \frac{\text{lollipop}^3}{\text{popsicle}^4}\)

\[A:\]

What’s the big idea? My sign... it changed!
O.K., now I get the basic idea of a square root (and I'm getting hungry, too!). But why do they call it a "square" root? What do squares have to do with it?

**Q:**

It's called a "square" root because you can understand its length by thinking about a square. Here's how: pick a number, any number. Then find a square whose area is equal to that number. Next measure the length of a side of this square. The length of that side, it turns out, is the square root of the number you started with. Presto, nothing up the sleeve. And ... now that you may be more confused than ever, here's an example to help you out.

**Example**

You know from geometry that the area of a square is just the length of one of its sides times itself. For example, if a side of a square is 4 inches, the area of this square would be:

\[(4 \text{ inches}) \cdot (4 \text{ inches}) = 16 \text{ square inches}\]

But if you think about it, 4 is the square root of 16. In other words, the length of the side is the square root of the area of the square.

\[
\text{Length of side} = \sqrt{\text{area of the square}}
\]

\[
4 \text{ inches} = \sqrt{16 \text{ square inches}}
\]
I hear that in order to factor, I first need to learn some concepts, namely: "monomial," "coefficient," "polynomial," "factor" and "greatest common factor."

Let me start at the beginning then: what is a monomial, and what is a coefficient?

**Q:**

A **monomial** is a mathematical term with two parts:

1) the **coefficient**, which is made up of the number in front, along with its sign.
2) a **variable** or a **string of variables**, each of which is raised to an exponent.

**Two typical monomials**

- $-\frac{1}{3}x^5$
- $4a^2c^3$

**Important point:** the sign of the monomial is part of the coefficient’s identity. In other words, if the monomial is positive, the coefficient is positive; if the monomial is negative, the coefficient is negative. As you see in the examples to the left, the monomial $4a^2c^3$ has a coefficient of $+4$; the monomial $-\frac{1}{3}x^5$ has a coefficient of $-\frac{1}{3}$. Keep in mind that when a monomial has no sign showing, like $4a^2c^3$, it actually has an invisible positive sign. That is: $4a^2c^3$ really means $+4a^2c^3$.

**Identify the coefficient in each of the following monomials:**

| a) $7xyz$ |  
| b) $-4v^7$ |  
| c) $0.6mn$ |  
| d) $\frac{2}{7}uv^4$ |  
| e) $-9pq^4$ |  

**Answers:**

|  
| $9r + (p)$ |  
| $\frac{6}{7} - (q)$ |  
| $L/3 + (p)$ |  
| $L + (e)$ |  

**ANSWERS:**
Now I get the basic idea. But what about trinomials in which the first two terms are positive and the last term is negative. How do I factor a trinomial like this:

\[ a^2 + 2a - 8 \]

You use the same, basic technique, but there’s one difference when the last term is negative — as it is here and on the next page. You must combine a positive and a negative number to get the coefficient of the middle term. Follow the steps below.

**Steps**

1st) Using the first tip (p. 155), write the parentheses with the variable.

2nd) Ask: what’s the coefficient of the middle term? What’s the value of the last term?

3rd) Then ask: what are the pairs of factors for the last term? Is there a pair of factors which add up to the coefficient of the middle term?

4th) Now just drop those factors (sign and number together) into the two parentheses.

**Example**

\[ a^2 + 2a - 8 \]

Coefficient of middle term is: +2

Last term is: -8

Since last term is negative, one of its factors is positive, the other negative (p. 49). Pairs of factors for -8 are:

\[ (+1, -8), (+2, -4), (-1, +8), (-2, +4) \]

Only pair adding to +2 is: \((-2, +4)\)

\[ a - 2 \] \[ a + 4 \]

\[ (a - 2)(a + 4) \]

**Now try factoring these trinomials:**

a) \( n^2 + 3n - 10 \)
b) \( t^2 + 7t - 18 \)
c) \( w^2 + 4w - 45 \)
d) \( u^2 + u - 2 \)
What is cancelling? And why should I learn how to cancel?

A: Ever felt the need to tidy up your room? If so, you should be able to understand the need for cancelling, for cancelling is the art of tidying up mathematical expressions.

To grasp the idea, imagine that one day, as you enter your bedroom, it’s so filthy that you’re knee-deep in trash. Despite yourself, you shout: “I can’t take it any more!” So you grab a wastebasket and furiously start tossing out junk. Eventually you find that beneath all the trash you still have a pretty nice room.

In math, you don’t have sloppy rooms to tidy, but you do have messy mathematical expressions. And instead of using a garbage pail, you need only grab your pencil, for with it you can cross out and toss out mathematical garbage. After you get rid of mathematical clutter, you’ll be left with a simple and beautiful mathematical expression.

Like cleaning up your room, cancelling may be less than fun to do, but once you’ve done it, you feel so much better!
Q: I think I’m starting to understand the phases. But it would help me to see the whole process — all three phases — displayed on one page. What would that look like?

A: To the right you’ll get the big picture for how you solved the model equation using the S.I.S. phases. And then you can test your skill by doing the QuikChek.

**Phases**

1st) **S**implify.

\[2(a + 3) + 4a - 9 = 8 + 3a - 4(a - 6)\]
\[\downarrow\]
\[6a - 3 = -a + 32\]

2nd) **I**solate.

\[6a - 3 = -a + 32\]
\[\downarrow\]
\[7a = 35\]

3rd) **S**olve.

\[7a = 35\]
\[\downarrow\]
\[a = 5\]

**Example**

\[
\begin{align*}
\text{Example} & \\
\text{2(a + 3) + 4a - 9} & = 8 + 3a - 4(a - 6) \\
\downarrow & \\
6a - 3 & = -a + 32 \\
\downarrow & \\
7a & = 35 \\
\downarrow & \\
a & = 5
\end{align*}
\]

Work through the S.I.S. phases to solve these equations:

a) \[4(x + 2) = 8(4 - 2)\]

b) \[5(d - 3) - 2d = 2(d + 1) + 4\]

c) \[-3(p - 7) + p - 9 = 8(p - 1) - 4p - 4\]

<table>
<thead>
<tr>
<th>(p)</th>
<th>(q)</th>
<th>(r)</th>
<th>(s)</th>
<th>(w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

\[\text{Example}\]

\[
\begin{align*}
\text{Example} & \\
\text{2(a + 3) + 4a - 9} & = 8 + 3a - 4(a - 6) \\
\downarrow & \\
6a - 3 & = -a + 32 \\
\downarrow & \\
7a & = 35 \\
\downarrow & \\
a & = 5
\end{align*}
\]

Answers:

Work through the S.I.S. phases to solve these equations:

\[
\begin{align*}
a) & 4(x + 2) = 8(4 - 2) \\
b) & 5(d - 3) - 2d = 2(d + 1) + 4 \\
c) & -3(p - 7) + p - 9 = 8(p - 1) - 4p - 4 \\
d) & 11 - 3(w + 2) = 7 - (4w + 5)
\end{align*}
\]
Q: I hear about special points called x-intercepts and y-intercepts. What exactly are these? How do I indicate these points? And why in the world are they called "intercepts" in the first place?

A: The x-intercept is the point where a line crosses the x-axis; the y-intercept, that point where a line crosses the y-axis. For example, if a line crosses the x-axis at the point \((-2, 0)\), you’d say the x-intercept is \((-2, 0)\), or, in a shorthand way of talking, you can say the x-intercept is \(-2\), since the line crosses the x-axis at \(-2\). In the same way, if a line crosses the y-axis at \((0, 3)\), the y-intercept is \((0, 3)\), or just \(+3\).

To see why these points are called intercepts, think about intercepted passes in football. Turning on your imagination, try to see the x-axis as the flight of a forward pass. Then go a step further. Imagine that a line crossing the x-axis is the path of a defensive player running to intercept the pass. The point where his/her path crosses the ball’s flight is where the intercept is made, so it’s the x-intercept. In the same way, if you view the y-axis as a forward pass, the point where a line crosses it is the y-intercept.
What exactly is “Mathlish”? And is there a guide to help me translate from English to “Mathlish”?

Imagine that you’re whisked away by helicopter and air-dropped into the backcountry of Kinnikanu. After parachuting down, you’d probably appreciate having a mini-dictionary so you could ask the locals survival questions like, “Hey, where can I grab a burger and fries around here?” The same holds for the Algebra Wilderness. You need a mini-dictionary so you can translate from English to “Mathlish,” that strange, seemingly foreign language that math is written in. Here’s the mini-dictionary you need:

<table>
<thead>
<tr>
<th>English</th>
<th>Mathlish</th>
</tr>
</thead>
<tbody>
<tr>
<td>is/was/will be/equals/the result is</td>
<td>=</td>
</tr>
<tr>
<td>of</td>
<td>\times \text{ or } -</td>
</tr>
<tr>
<td>a number</td>
<td>n</td>
</tr>
<tr>
<td>the opposite of a number</td>
<td>-n</td>
</tr>
<tr>
<td>three consecutive integers</td>
<td>n, n+1, n+2</td>
</tr>
<tr>
<td>three consecutive odd or even integers</td>
<td>n, n+2, n+4</td>
</tr>
<tr>
<td>sum/more than/increased by/and</td>
<td>+</td>
</tr>
<tr>
<td>difference/less than/decreased by</td>
<td>-</td>
</tr>
<tr>
<td>product/times/multiplied by</td>
<td>\times \text{ or } /</td>
</tr>
<tr>
<td>quotient/over/divided by</td>
<td>+/ \text{ or fraction symbol: } /</td>
</tr>
<tr>
<td>what number/what fraction</td>
<td>n</td>
</tr>
<tr>
<td>what percent</td>
<td>n/100</td>
</tr>
<tr>
<td>quantity</td>
<td>( )</td>
</tr>
</tbody>
</table>
Glossary

Note: words highlighted in definitions are defined elsewhere in the glossary.

absolute value: the distance between a number and zero. Absolute value is always positive because distance is always positive.

additive identity property: property that says when you add zero to any number or term, you get back the number or term you started with.

associative property: property that says that in addition and multiplication, the way the terms are grouped makes no difference. In other words, \( a + (b + c) = (a + b) + c \) and \( a \cdot (b \cdot c) = (a \cdot b) \cdot c \)

base: the bottom number in an exponential term. Example: in the exponential term \( x^7 \), the base is \( x \), while the exponent is \( 7 \).

binomial: a polynomial made up of two monomials.

cancelling: the act of tidying up mathematical expressions.

coefficient: the number that stands in front of the variable or variable string in a monomial. A coefficient may be positive or negative. Example: in the monomial \( 5x^3y \), the coefficient is \( +5 \); in the monomial \( -5x^3y \), the coefficient is \( -5 \).

commutative property: property that says that in addition and multiplication, the order of the terms makes no difference. In other words, \( a + b \) is the same as \( b + a \), and \( a \cdot b \) as the same as \( b \cdot a \).

consecutive integers: integers that are one apart from one another. Example: \( 4, 5 \) and \( 6 \) are consecutive integers.

coordinate: a number which, by acting as a directional tool, helps you locate a point on the coordinate plane. Each point on the coordinate plane has both an \( x \)-coordinate and a \( y \)-coordinate.

coordinate plane: the \( x \)-\( y \) plane, used for graphing points, lines, and more.

denominator: the quantity below a fraction bar is the denominator. (Compare with numerator.)

descending order: a way of writing a polynomial so that its exponents decrease from left to right.

distance: the measure of the length of a line between two distinct points.

distributive property: a property that says this: If you have a parenthesis containing a bunch of terms linked by addition or subtraction signs, any number or term that multiplies the parenthesis multiplies every term inside the parenthesis.
That is: \( a( b + c) = a \cdot b + a \cdot c \) and \( a(b - c) = a \cdot b - a \cdot c \)

equation: any mathematical expression that has an equal sign and quantities on both the left and right sides of the equal sign. An equation tells you that these two quantities are equal.

even numbers: the set of all numbers: \( \{\ldots -6, -4, -2, 0, 2, 4, 6, \ldots \} \) (Compare with odd numbers.)

exponent: a little number or term that sits on the right shoulder of another number or term called the base.
The exponent tells you how many times the base is multiplying itself. For example: in the exponential term \( x^7 \), the exponent \( 7 \) tells you that \( x \) is multiplying itself \( 7 \) times.

exponential term: the base and the exponent, viewed as a whole.

factor: one of two or more terms which, multiplied together, give you some product.
Examples: \( 3 \) and \( 5 \) are factors of \( 15 \) because \( 3 \cdot 5 = 15 \); and \( x \) and \( x^2 \) are factors of \( x^4 \) because \( x \cdot x^2 = x^3 \).
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