

INDEX

Pages numbers that are underlined refer to SECTION SUMMARY entries. Entries that are not conducive to alphabetical ordering are listed first, in order of their appearance in the book.

$x \cdot y$	<u>10</u>	arrow	13
\mathbb{R}	14, <u>21</u> , 50	at least	62, <u>70</u>
\emptyset	14, <u>36</u>	at most	62, <u>70</u>
... (three lower dots)	15	average	18, <u>23</u>
\mathbb{Z}	18, <u>22</u> , 51	backwards (reading a sentence)	68
$a = b$	19, <u>23</u>	big	16, <u>22</u>
$a \neq b$	19, <u>23</u>	bracket	32
-3	<u>22</u>	checking a solution	121, <u>123</u>
\in	28, <u>36</u>	class (of sentences)	63
$x \in S$	29, <u>36</u>	clothes sale	46, 47
$x \notin S$	<u>36</u>	collection	26
\notin	30	commands (versus facts)	112, <u>123</u>
/ (slash)	30, <u>36</u>	communication	7
{ }	31	commutative property of addition	113
$\infty, -\infty$	31, <u>37</u>	comparing (expressions versus sentences)	94
[] (brackets)	32, <u>37</u>	complete thought	5
() (parentheses)	32, <u>37</u>	computer science	14
{ } (braces)	<u>36</u>	concise	1
{ } (empty set)	<u>36</u>	connective	9, 97, 103, <u>108</u>
$(a, b), (a, b], [a, b), [a, b]$	<u>36</u>	consecutive	15, <u>22</u>
$(a, \infty), [a, \infty)$	<u>36</u>	context	43
$(-\infty, b), (-\infty, b]$	<u>37</u>	convention	3, 44, 50, 117
$-x$ (opposite of x)	42	cornbread	82
For all real numbers x and y	<u>54</u>	corollary	78, <u>90</u>
For all $x \in \mathbb{R}$ and $y \in \mathbb{R}$	<u>54</u>	count	13
$x \in \mathbb{R}$ (how to read)	<u>54</u>	cubic foot	88
For all $x \in \mathbb{R}$ (how to read)	<u>54</u>	dangling equal signs	85
Let $x \in \mathbb{R}$ (how to read)	<u>54</u>	decimal	13
xy	<u>54</u>	declarative mode	112, <u>123</u>
$2x$	<u>54</u>	defined, not defined	106, <u>109</u>
$2x + 1$	<u>54</u>	definition	7, 27
$2(x + 1)$	<u>54</u>	denominator	86, <u>91</u>
$x < y, x > y, x \leq y, x \geq y$	59, <u>70</u>	dense	18
$xy = 0$ (equations of this form)	66, <u>70</u>	density property of \mathbb{R}	18, <u>22</u>
$a = b = c$ (sentence of this form)	80, <u>91</u>	display mode	102
$\frac{1 \text{ foot}}{12 \text{ inches}}$	87	distance from zero	16
\iff	101, <u>108</u> , <u>109</u>	do this ... do this	112
absolute value	16	division by zero is not allowed	82, 130
addition property of equality	112, 114, <u>123</u>	dust	32
Why is it true?	119	element of a set	27, <u>36</u>
ad infinitum	15	empty set	31
ambiguity	7, 146	Esty, Warren	112
'and' (English word)	9, 97	equality	
'and' (mathematical word)	98, 103, 104, <u>109</u>	of expressions	95, <u>108</u>
anxiety	112	of real numbers	19

equation	64, <u>70</u>	let $NAME = EXPRESSION$	29, <u>36</u>
equivalence	64, <u>108</u>	list method	27, <u>36</u>
equivalent	95	lowercase letters	50, <u>55</u>
truth table for ‘is equivalent to’	99, <u>108</u>	from end of alphabet	<u>55</u>
mental word replacement	100	from middle of alphabet	<u>55</u>
alternate ways to say ‘is equivalent to’	101	mapping diagram	44, <u>54</u>
expression	2, 7, 8, <u>10</u>	matrices	8
extraneous solution	131	measure	13
facts (versus commands)	112, <u>123</u>	member of a set	27, <u>36</u>
types of expressions	8	memory devices:	
finite set	27, <u>36</u>	for < and >	60
‘for all’ sentences	41, 113, <u>123</u>	for [] versus () in interval notation	32
when is it okay to omit ‘for all’	106	sentences are equivalent	95
format:		midpoint	19
for simplifying an expression, preferred	<u>91</u>	multiplication property of equality	128, <u>138</u>
for simplifying a long expression, preferred	<u>91</u>	Why is it true?	134
fraction	13, 86, 87	multiplying by zero	130, <u>138</u>
frugal	33	names	8
functions	8	for zero	78, <u>90</u>
game with numbers	75	for one	79, <u>90</u>
generalization	113, <u>123</u>	negative	14, <u>21</u>
graph	<u>71</u>	nonnegative	15, <u>21</u>
graph of a sentence	67, <u>71</u>	nonpositive	15
graph of a sentence in one variable	<u>71</u>	nonsensical	5
greatest	61, <u>70</u>	nonzero	15, <u>21</u>
hand-writing	52, <u>55</u>	nouns	1
‘holding’ objects	40	number	2, 8, 20, <u>22</u>
hollow dot	13, <u>21</u>	number line	13
identify	13	numerator	86, <u>91</u>
if and only if	101, <u>108</u>	operation	9
iff	101, <u>108</u> , <u>109</u>	opposite	17, <u>22</u> , 42
imperative mode	112, <u>123</u>	‘or’ (the mathematical word)	61, 103, 104, <u>109</u>
inequality	64, <u>70</u>	English versus mathematics	104
infinite set	27, <u>36</u>	order	13, 16, <u>21</u> , 58, <u>70</u>
infinity	31	ordered pair	8
inspection	49, <u>55</u>	order of operations conventions	45
integer	18, 51	output	143
interchangeable (sentences)	94	overriding conventions	51
interval	31	parenthesis	32
interval notation	31	passing cars	46, 89
italic typestyle	52	percent	13, 47
language:		point	14
importance of	1	positive	14, <u>21</u>
summary diagram	0	powerful	1
written versus spoken	27	precise	1
Language of Mathematics, The	112	proposition	78, <u>90</u>
large	16, <u>21</u>	proving a result	78, <u>90</u>
lazy	13, 14	reading aloud	42, 45, <u>54</u>
least	61, <u>70</u>	real number	13, 50
lemma	78, <u>90</u>	real number line	13, <u>21</u>

reciprocal	79, <u>90</u> , 135	variable	40, <u>54</u>
sandbox	88	common uses	41, <u>54</u>
sentence	1, 2, 8, <u>10</u>	compound sentences using variables	105
different styles	43	different names allow for different choices	43
‘for all’ sentence	41	hand-writing	52, <u>55</u>
in one variable	65, <u>70</u>	to represent a sequence of operations	44
in n variables	<u>70</u>	to represent an unknown quantity	46, 47
to describe order relationships	59	to state a general principle	41
solving	49	reading aloud	42
sequence of operations	44	vectors	8
set	8, 26, <u>36</u>	verbs	2, 9
set-builder notation	33	vocabulary	1
shorthand	44	whole number	15, <u>21</u>
simplify	8, 9, <u>10</u>	zero	14
simplifying an expression	84, 85, <u>91</u>		
size of a number	16, <u>21</u>		
slash	30, <u>36</u>		
small	16, <u>22</u>		
solid dot	<u>21</u>		
solution of a sentence in one variable	66, <u>70</u>		
solution set	66, <u>70</u>		
solving a sentence	49, <u>54</u> , 85, 116, <u>123</u> , 132		
preferred formats	118, <u>123</u>		
sparse	15		
special property			
of one	77, <u>90</u>		
of zero	77, <u>90</u>		
stylistic considerations	102		
subcollection	15		
subsentence	98		
subset	33, <u>37</u>		
symbols	9		
synonyms	2, 76, 101		
table	145		
text mode	102		
theorem	77, <u>90</u>		
transforming process	49		
translating a theorem	78		
tree diagram	99		
truth	2		
of a compound sentence	98		
truth table	98, 99, <u>108</u>		
undo the last operation first	133, 134, <u>138</u>		
unit conversion	86, 87, 88		
names for 1 used in	<u>91</u>		
universal set	40, <u>54</u>		
uppercase letters	50, <u>55</u>		
uses for numbers	<u>21</u>		
vagueness	26		