1.9 Chapter 1 Review

ESSENTIAL AXIOMS/DEFINITIONS

Axiom	Symbol	Short	Example
Addtion Table		$[AT]$	$3+5=8$
Times Table		$[TT]$	$3\cdot 5=15$
Commutativity Law of Addition		$[CoLA]$	$3+5=5+3$
Commutativity Law of Multiplication		$[CoLM]$	$3\times 5=5\times 3$
Associativity Law of Addition		$[ALA]$	$(3+5)+7=3+(5+7)$
Associativity Law of Multiplication		$[ALM]$	$3(xy)=(3x)y$
Additive Identity		$[AId]$	$x+0=x$
Multiplicative Identity		$[MId]$	$x\cdot 1=x$
Additive Inverses		$[AInv]$	$-5+5=0$
Multiplicative Inverses		$[MInv]$	$5\cdot\frac{1}{5}=1$
Cancellation Law of Addition		$[CLA]$	$A=B \implies (A)+c=(B)+c$
Cancellation Law of Multiplication		$[CLm]$	$A=B \implies (A)c=(B)c$
Reflexive Property		$[RP]$	$A=A$
Symmetric Property		$[SP]$	$A=B \implies B=A$
Transitivity Property		$[TP]$	$A=B\&B=C \implies A=C$

2.7 Chapter 2 Review

ESSENTIAL DEFINITIONS & THEOREMS

Definition/Theorem	Short	Example
Zero Multiplication Theorem	$[0MT]$	$3 \cdot 0 = 0$
Minus Theorem	$[MT]$	$-1 \cdot 3 = -3$
Negative times Positive Theorem	$[NPT]$	$-5 \cdot 3 = -15$
Negative One Times Negative One Theorem	$[NotNot]$	$-1 \cdot -1 = 1$
Negative times Negative Theorem	$[NNT]$	$-5 \cdot -3 = 15$
Negative Plus Negative Theorem	$[N + NT]$	$-5 + -3 = -8$
Natural Exponents	$[N.Expo]$	$5^3 = 5 \cdot 5 \cdot 5$
Just Add Exponents	$[JAE]$	$5^3 \cdot 5^4 = 5^7$
Power to Power	$[P2P]$	$\left(5^3\right)^4 = 5^{12}$
Definition of Subtraction	$[defa - b]$	$5 - 3 = 5 + -3$

3.7 Chapter 3 Review

ESSENTIAL DEFINITIONS & THEOREMS

Definition/Theorem	Short	Example
Add Tops Theorem	$[ATT]$	$\frac{2}{7}+\frac{3}{7}=\frac{5}{7}$
Just One Theorem	$[JOT]$	$\frac{7}{7}=1$
Multiply Acorss Theorem	$[MAT]$	$\frac{2}{3}\cdot\frac{4}{5}=\frac{8}{15}$
Multiply Bottoms Theorem	$[MBT]$	$\frac{1}{3}\cdot\frac{1}{5}=\frac{1}{15}$
Negative Wherever you Want	$[NWW]$	$\frac{-2}{3}=-\frac{2}{3}=\frac{2}{-3}$
One Under Theorem	$[OUT]$	$5=\frac{5}{1}$
Definition of Divide	$[Def\div]$	$5\div 6=\frac{5}{6}$
Flip Bottoms Theorem	$[FBT]$	$\frac{7}{\frac{3}{5}}=7\cdot\frac{5}{3}$
Kill The Coeffificent	$[KTC]$	$Ax=B \implies x=\frac{B}{A}$

4.10 Chapter Review

Very Famous Polynomials

name	Short	Example
FOIL	$[FOIL]$	$(A+B)(C+D) = AC + AD + BC + BD$
Difference of Squares	$[DS]$	$x^2 - y^2 = (x-y)(x+y)$
Difference of Cubes	$[DS]$	$x^3 - y^3 = (x-y)(x^2+xy+y^2)$
Sum of Cubes	$[SC]$	$x^3 + y^3 = (x+y)(x^2-xy+y^2)$
Sum of Cubes	$[PP2]$	$(x+y)^2 = x^2 + 2xy + y^2$

Pascal Polynomials

name	Short	Example
Pascal Polynomial #2	$[PP2]$	$(x+y)^2 = x^2 + 2yx + y^2$
Pascal Polynomial #3	$[PP3]$	$(x+y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$
Pascal Polynomial #4	$[PP4]$	$(x+y)^4 = x^4 + 4x^3y + 6x^2y^2 + 6xy^3 + y^4$
Pascal Polynomial #5	$[PP5]$	$(x+y)^5 = x^5 + 5x^4y + 10x^3y^2 + 10x^2y^3 + 5xy^4 + y^5$

Geometric Series Polynomials

name	Short	Example
Geometric Series #2	$[GS2]$	$x^2 - 1 = (x-1)(x+1)$
Geometric Series #3	$[GS3]$	$x^3 - 1 = (x-1)(x^2+x+1)$
Geometric Series #4	$[GS4]$	$x^4 - 1 = (x-1)(x^3+x^2+x+1)$
Geometric Series #5	$[GS5]$	$x^5 - 1 = (x-1)(x^4+x^3+x^2+x+1)$

Generalized Geometric Series Polynomials

name	Short	Example
Geometric Series #2	$[GGS2]$	$x^2 - y^2 = (x-y)(x+y)$
Geometric Series #3	$[GGS3]$	$x^3 - y^3 = (x-y)(x^2+xy+y^2)$
Geometric Series #4	$[GGS4]$	$x^4 - y^4 = (x-1)(x^3+x^2y+xy^2+y^3)$
Geometric Series #5	$[GGS5]$	$x^5 - y^4 = (x-1)(x^4+x^3y+x^2y^2+xy^3+y^4)$

0.9 Chapter 5 Summary

Solving Linear Equations

name	from	to
Free the terms	$3(x+1) = \frac{x+1}{2}$	$3x + 1 = \frac{1}{2}x + \frac{1}{2}$
Shuffle the terms	$3x + 1 = \frac{1}{2}x + \frac{1}{2}$	$3x + -\frac{1}{2}x = -1 + \frac{1}{2}$
Collect the terms	$3x + -\frac{1}{2}x = -1 + \frac{1}{2}$	$\left(3 + -\frac{1}{2}\right)x = -1 + \frac{1}{2}$
Kill the Coefficient	$\left(3 + -\frac{1}{2}\right)x = -1 + \frac{1}{2}$	$x = \frac{-1+\frac{1}{2}}{3+-\frac{1}{2}}$

Theorems

name	symbol	says
Zero Factor Theorem	*ZFT*	$A \cdot B = 0 \implies A = 0$ *or* $B = 0$
Square Root Property	*SRP*	$x^2 = a \implies x = \pm\sqrt{a}$
Absolute Value Theorem	*AVT*	$\lvert x\rvert = a \implies x = a$ *or* $x = -a$
Quadratic Formula	*QF*	$ax^2 + bx + c = 0$ $\implies$ $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

Strategies

example	strategy	such as
$x^2 + 3x + 2 = 0$	*Factors & ZFT*	$(x+2)(x+1) = 0$
$x^2 + 3x + 2 = 0$	*Complete PP2 & SRP*	$\left(x + \frac{3}{2}\right)^2 = \frac{9}{4}$
$x^2 + 3x + 2 = 0$	*Quadratic Formula*	$x = \frac{-3 \pm \sqrt{3^2-4\cdot1\cdot2}}{2\cdot1}$
$x^2 - 9 = 0$	*Recognize Famous*	$(x-3)(x+3) = 0$