Ch1

Underlined words are words highlighted in yellow

1.1 Variables & Expressions

$2x+4$ Algebraic Expression

$2x+4=8$ Algebraic Equation

x = variable, y, a, b, etc # can vary!

1 value is called a term

multiply → product 2×4 or $2 \cdot 4$

now $2(4)$

$2 \cdot x = 2x$

1st.

Power x^n ← exponent

↑ base

2^3 = 2 to the 3rd power

on calculator:

x^y

y^x

Ex $2^3 = 8$

$4^2 = 16$

See chart on p. 6

+

−

×

÷

1.2 Order of Operations

PEMDAS

P = Parentheses ( ) { } [ ]

E = Exponents x^{3e}

M & D = Multiplication & Division
Whatever comes 1st
from left to right

A & S = Addition & Subtraction
Whatever comes 1st
from left to right

evaluate means solve

Ex) $3+42 \cdot 2-5 = 82$

Ex) $20-7+8^2-7 \cdot 11 = 0$

Show silly calculators vs. Scientific

Ex. $5.4(10-8)+20 = 60$

Ex. $15-[10+(3-2)^2]+6$

Evaluate an expression Substitute these values for x!
$x = 0, 1, 2, 3, 4$

Ex) $2x$ $x=0$, $2(0)=0$
$x=1$ $2(1)=2$
$x=2$ $2(2)=4$
$x=3$ $2(3)=6$

1.3 Properties of Numbers

Reflexive Property $a = a$

Symmetric Property $a = b$, then $b = a$

Transitive Property If $a = b$ & $b = c$ then $a = c$

Substitution Property If $a = b$ then b can replace a in any expression.

Additive Identity $a + 0 = 0 + a = a$

Additive Inverse $a + -a = 0$

Multiplicative Identity $a \cdot 1 = a$

$1 \cdot a = a$

Multiplicative Property of zero, $a \cdot 0 = 0$

$0 \cdot a = 0$

Multiplicative Inverse $\frac{a}{b} \cdot \frac{b}{a} = 1$ $a \neq b \neq 0$

$\frac{b}{a} \cdot \frac{a}{b} = 1$

Commutative Property $a + b = b + a$

(order changes)

Associative Property $(a + b) + c = a + (b + c)$

Grouping changes

CD p. 19 1-8 Evaluate only

Comp. 19, 9-14 Evaluate only

HW: WKSH SP. & Practice

1.4 Distributive Property

$2(3+4)$ PEMDAS

$2(7) = 14$

$2(3)+2(4) = 6+8 = 14$

Distributive Property

$a(b+c) = ab+ac$

$a(b-c) = ab-ac$

Distribute to everyone!

$2(x^2+3x+6) = 2x^2+6x+12$

Ex) $12(y+3) = 12y+36$

Ex) $4(y^2+8y+12) = 4y^2+32y+48$

Combine like terms ChT

Show on board → colors

x, x

x^2, x^2

y, y

xy, xy

Ex) $6n-4n = 2n$ Ex, $4n^2+3n+8n^2-2n+6 = 12n^2+n+6$

Standard Form → highest exponent to lowest exponent

1.5 ammended

Constant Difference

1, 2, 3, 4, 5, . . .
+1 +1 +1 6, 7, 8

2, 4, 6, 8 10, 12, 14, 16
+2 +2 +2

2, 3, 5, 8, 12
+1 +2 +3 +4 ∈ Not CD
+1 +1 +1 ∈ CD

x = 0, 1, 2, 3, 4, 5

2x

x	0	1	2	3	4	5
2x	0	2	4	6	8	10

Use Alg. x=0 x=1 x=2
Use CD to find rest.

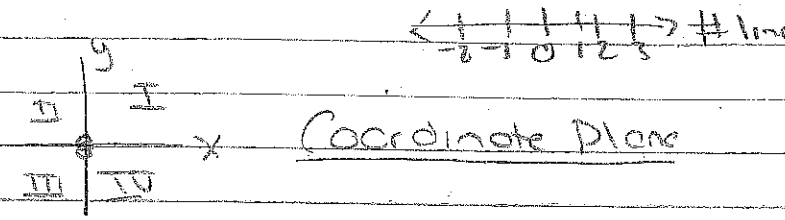
x = 0, 1, 2, 3, 4, 5

5x-1

x	0	1	2	3	4	5
5x-1	-1	4	9	14	19	24

CW Wksh 1.1 old book
HW Wksh 1.1 PMA old book

1.6 Relations



Coordinate Plane

Ordered pair (x,y)

a set of ordered pairs is called a relation

(1) Set up Coordinate plane

4 Quadrants

Graph the following

(0,0) Origin

(1,4) A

(-1,6) B

(2,-3) C

(-4,-8) D

Domain x values

Range y values

(2,4) (3,6) (5,8)

x y x y x y

Domain = {2,3,5} Range = {4,6,8}

(1) p. 41. Ordered pairs, vs table vs Graph vs mapping

X is independent

y is dependent y values depend on x values

1.7 Functions

Domain = x values

Range = y values

If every # in domain occurs once - it's a function

no - it's not

Ex① (1,2) (3,4) (5,6) (7,8)

D = {1,3,5,7} ← Function

R = {2,4,6,8}

Ex② (1,2) (1,6) (3,8) (5,6)

D = {1,1,3,5} ← Not

mapping Ex①

1 → 2

3 → 4 Function

5 → 6

7 → 8

Ex②

1 → 2

→ 6 Not

3 → 8

5 → 6

Vertical line test - hit once → yes function

hits more than once → not

$x = 0, 1, 2, 3, 4, 5$

$4x-2$

x	0	1	2	3	4	5
$4x-2$	-2	2	6	10	14	20

$y = 4x-2$

(0,-2) (1,2) (2,6) (3,10) etc

Now you can graph it!

Is it a Function

D:

Or vertical line test

$y = 3x-4$ or $f(x) = 3x-4$ Function notation

$y = f(x)$

$f(2) = 3(2)-4 = 6-4 = 2$ (2,2)

$f(3) = 3(3)-4 = 9-4 = 5$ (3,5)

$f(2x) = 3(2x)-4 = 6x-4$ $(2x, 6x-4)$

CDpSI 1-8

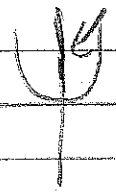
CWpSI, 11-25, 31, 39-44

HW 1.7 SP+P

1.8 Interpreting Graphs of Functions

x intercept is where the graph crosses the x axis

y intercept is where the graph crosses the y axis



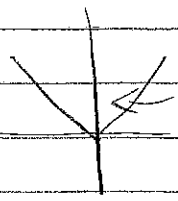
$y = x^2$ Quadratic Function

x	-3	-2	-1	0	1	2	3
y	9	4	1	0	1	4	9

line of symmetry which means that if I were to fold along that line then both sides would match

$y = |x|$ Absolute Value Function

x	-3	-2	-1	0	1	2	3
y	3	2	1	0	1	2	3



When graphs is above x axis it's positive
below x axis it's negative

/ increase \ decrease — constant

extrema relatively low or high function values

relative minimum

lowpoint

relative maximum highpt.

endbehavior ↑↓ (TPD)

CD p. 57. Chart

CW p. 63 9-71 odds

HW p. 63, 8-70 evens

Day 2

CW 1.8 SP

HW 1.8 P