

Chapter 1B Student Success Sheet (SSS)

Tools of Algebra

1

Olathe East High School – Intermediate Algebra

Name: _____
Hour: _____

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Success is nothing more than a few simple disciplines practiced every day.

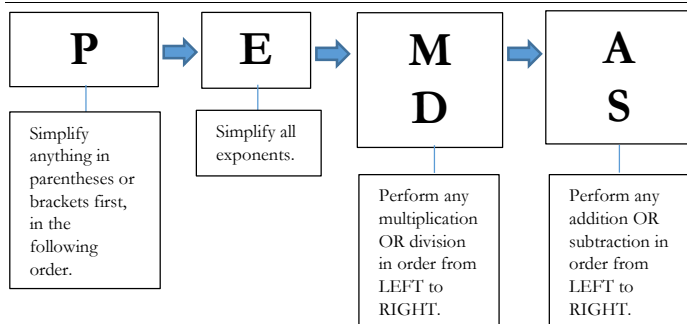
Jim Rohn

Concept #	What we will be learning...
6	Word problems using basic operations
7	Order of operations – numbers only
8	Order of operations – evaluating numbers (up to 3 substitutions)
9	Using the distributive property
10	Combining like terms

#6 Word Problems with Basic Operations

1. A diver dives 47 ft. below the surface of the water and then rises 12 ft. Find the diver's depth.
2. On two football plays, a team gains 8 yards and then loses 5 yards. Find the result of the two plays.
3. One morning in Detroit, Michigan, the temperature at 6am was -6°F . The temperature rose 13°F by noon. Find the temperature at noon.
4. A pot of water has a temperature of 25°C . How many degrees should you raise the temperature to boil the water at 100°C ?
5. Ramona is 68 in. tall and Sophie is 73 in. tall. How much taller is Sophie than Ramona?
6. A company buys 1500 small times from a manufacture for $\$0.02$ a piece. What is the total cost of the items?
7. If 36 people are at a pizza party, how many eight-piece pizzas need to be ordered so each person can get two pieces of pizza?
8. Your parents drove the family car 462 miles on 14 gallons of gas. On average, how many miles did the car travel on each gallon of gas?
9. Cereal is on sale for $\$3.95$ per box. What is the cost of seven boxes?
10. The school drama club is putting on a play. If there will be five shows and the auditorium holds 480 people, how many people can see the show?
10. What is the total cost of four CDs on sale for $\$12.50$ each?
12. An NFL player weighs 397 pounds but then lost 20 pounds during off season practice. What is his weight now?
13. Three friends go to the movies and buy a ticket to see a movie for $\$9$. How much did they spend total?
14. You are going to buy a new jacket but only have $\$20$ to spend. The new jacket you want costs $\$45.97$ including tax. How much more money do you need?

#7 Order of Operations – numbers only



$$11) 2 - (-4 - 4)$$

Parentheses first!

$$= 2 - (-8)$$

NO exponents!

NO multiplication or division!

Add or Subtract LAST!

$$= 2 + 8$$

$$= \mathbf{10}$$

NOTHING left!

$$12) (-5 - 2)^2$$

Parentheses first!

$$= (-7)^2$$

Exponents next!

$$= \mathbf{49}$$

NOTHING left!

---Unit 1B Student Success Sheet---Tools of Algebra---Intermediate Algebra

13) $5^2 - 5$

14) $3 - (-2 + 3)$

15) $-1 - (-12) \div 4$

16) $(3 - 1) \cdot -5$

17) $(-4 \div 4 - 1) \cdot -4$

18) $-5 - 2 \cdot 4 \div -2$

19) $(-12 \cdot 2) \div -4 + 3$

20) $(-1 - 4) \div (-4 + 3)$

21) $(= 4 \div -4)^2 \cdot -3$

22) $(6 \cdot 2 \cdot 2) \div -6$

23) $(-2 \cdot 2) \div -1 - (-6)$

24) $(3 \cdot 2) \div (2 - 4)$

25) $8 \div (-2 \cdot -1)^2$

26) $2 \div (-4 \cdot -1 - 5)$

27) $2 + -6 - (-6 - 1)$

28) $-4 \div (-2 + 3 - -1)$

#8 Order of Operations – evaluating numbers (up to 3 substitutions)

Evaluate means to _____ and _____
 Whatever you plug in, you put in _____

<p>29) $z - y \div 2$; use $y = 2$ and $z = 2$ $= (2) - (2) \div 2$ Nothing in Parentheses to simplify! NO exponents! Multiplication or <u>DIVISION</u> next! $= 2 - 1$ Addition or <u>SUBTRACTION</u> last! $= \mathbf{1}$</p>	<p>30) $y^2 - x$; use $x = 3$ and $y = 5$ $= (5)^2 - (3)$ Nothing in Parentheses to simplify! <u>Exponents</u> first! $= 25 - 3$ NO multiplication or division! Addition or <u>SUBTRACTION</u> last! $= \mathbf{22}$</p>
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31) $x + zx$; use $x = 2$ and $z = 5$

32) $m - (m - q)$; use $m = 6$ and $q = 3$

33) $r + p^3$; use $p = 2$ and $r = 2$

34) $x(y - z)$; use $x = 5, y = 6,$ and $z = 3$

35) $p(p + r - r)$; use $p = 2$ and $r = 6$

36) $z \div 5 + y - x$; use $x = 1, y = 6,$ and $z = 5$

37) $(zx - x) \div 4$; use $x = 4$ and $z = 3$

38) $a(c + b + c)$; use $a = 6, b = 2,$ and $c = 4$

39) $5k - 5j$; use $j = 5$ and $k = 6$

40) $x + (1 - z) \div 6$; use $x = 3$ and $z = 1$

#9 Using the Distributive Property

General properties:

$a(b + c) =$ _____ example: _____

$a(b - c) =$ _____ example: _____

$(b + c)a =$ _____ example: _____

$(b - c)a =$ _____ example: _____

$-(a + b) =$ _____ example: _____

$-(a - b) =$ _____ example: _____

41) $9(1 + 6b)$ $= 9 + 54b$	42) $5(9 - v)$ $= 45 - 5v$
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43) $-9(1 + 8n)$

44) $10(5x - 9)$

45) $-10(1 - 5k)$

46) $-9(a - 9)$

47) $-10(-6x - 10)$

48) $6(7x - 10)$

49) $-6(-3 - 10n)$

50) $-(-7m + 10)$

51) $-4(x + 2)$

52) $10(1 - 4p)$

#10 (Part 1) Combining Like Terms

In an algebraic expression, a **term** is a number, a variable, or the product of a number and one or more variables.

$$6a^2 - 5ab + 3b - 12 \leftarrow \text{A constant is a term that has no}$$

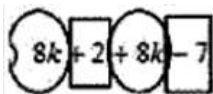
A **coefficient** is a numerical factor of a

Think of $3b - 12$ as $3b + (-12)$ to determine that the constant is -12 .

Like terms have exactly the same variable factors.

Like Terms	Not Like Terms
$3x$ and $-2x$	$8x$ and $7y$
$-5x^2$ and $9x^2$	$5y$ and $2y^2$
xy and $-xy$	$4y$ and $5xy$
$-7x^2y^3$ and $15x^2y^3$	x^2y and xy^2

53) $8k + 2 + 8k - 7$



$= 16k - 5$

54) $2a - 10 + 1 + 5a$

55) $-9x - x$

56) $1 - 6x + 7$

57) $3n + 7n$

58) $3 - 10m + 8m + 9$

59) $3p - 6p$

60) $-4x + 4x$

61) $-5b + 4b$

62) $n - 4 - 6$

63) $4 - r - 9$

64) $-5x - 10x$

65) $3a - 5 - 9a$

66) $1 + 5n + n + 3$

67) $-2x - 5 + 8$

68) $8v - 6v$

69) $8x - 7x$

70) $a + 4 + a - 2$

71) $-k - 6k$

72) $5p + 5p$

#10 (Part 2) Combining Like Terms After Using Distributive Property

Now, use the Distributive Property first, THEN combine like terms!

$$\begin{aligned} 73) \quad & -5(8n - 8) + 4 \\ & = -40n + 40 + 4 \\ & = -40n + 44 \end{aligned}$$

$$\begin{aligned} 74) \quad & 8x - 9(1 - 8x) \\ & = 8x - 9 + 72x \\ & = 80x - 9 \end{aligned}$$

$$75) \quad 4(2r - 9) + 4r$$

$$76) \quad 10m - 8(6m - 8)$$

$$77) \quad 9 - 9(1 + 6x)$$

$$78) \quad -9(1 + 10n) - 8$$

$$79) \quad -9(b + 5) - 3b$$

$$80) \quad -8(9 + 3v) - 7$$

$$81) \quad 10(6n + 3) - 3$$

$$82) \quad 5x + 6(-9x + 3)$$

$$83) \quad -8(10 + 5k) - 10(10k + 2)$$

$$84) \quad 3(1 + 7a) + 6(2a + 2)$$

$$85) \quad -3(6x + 7) - 6(8 + 2x)$$

$$86) \quad 9(x + 5) - (-7x + 2)$$