Review the concepts and sample problems that follow. Both will be helpful in completing the packet.

When simplifying expressions involving positive and negative numbers:
I. Rewrite expression without double notation (2 signs in front of a number).

Example:

a) $3+(+2)$	b) $3+(-2)$	c) $3-(-2)$	d) $3-(+2)$
$3+2$	$3-2$	$3+2$	$3-2$

II. Then use the following rules to add or subtract the terms.
1) Same signs – keep the sign and add the numbers
2) Different signs- take the sign of the larger number and subtract the numbers.

Sample Problems:

1) $7+(-10)$	2) $5-(-4)$	3) $-6-(-9)$
$7-10$	$5+4$	$-6+9$
-3	9	3

4) $-2-2$	5) $-8+12$	6) $4-(+6)$
-4	4	4-6
		-2

When multiplying or dividing positive and negative numbers:
(2 numbers at a time).

1) Same signs – positive
2) Different signs – negative

Sample Problems:

1) $(-4)(-3)$	2) $\frac{-6}{2}$	3) $(-2)(-3)(-4)$	4) $\frac{-20}{-4}$
12	-3	-24	5

Remember to combine "like terms" when simplifying expressions involving addition or subtraction:

$2x + 3 + 4x - 5$

$2x + 4x + 3 - 5$ (Rearrange terms mentally)

$6x - 2$ (Combine)

Use order of operations when simplifying:

$(4 - 8) - (-20 + 25)$

$(-4) - (5)$

$-4 - 5$

-9

Use the distributive property when appropriate:

$4(x - 2)$

$4(x) - 4(2)$

$4x - 8$

$2(a - 3b)$

$2(a) + 2(-3b)$

$2a - 6b$

To evaluate expressions, replace the variables with the numerical values given and simplify.

Sample Problems:

Evaluate if: $a = -2$ and $b = -3$

1) $a - b$

$(-2) - (-3)$

$-2 + 3$

1

2) $-3a + b$

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

$6 - 3$

3

3) $\frac{4 + ab}{a - b}$

$\frac{4 + (-2)(-3)}{-2 - (-3)}$

10

4) $-2ab$

$-2(-2)(-3)$

-12

When Solving Equations:

1) Simplify each side of the equation as needed.

2) Use inverse operations to "undo" the operations in the equations.

(Show all work. Do not solve mentally and do not use a calculator.)

Sample Problems:

1) $x - (-3) = 10$

$x + 3 = 10$ Rewrite without double notation

$-3 \quad -3$ Subtract 3 from both sides and simplify

$x = 7$

2) $n + (-5) = -20$

$n - 5 = -20$ Rewrite without double notation

$+5 \quad +5$ Add 5 to both sides and simplify

$n = -15$

3) $-2n + 4 = -8$

$-4 \quad -4$ Subtract 4 from both sides

$\frac{-2n}{-2} = \frac{-12}{-2}$ Divide both sides by -2 and simplify

$n = 6$

4) $\frac{n}{-3} + 9 = 6$

$-9 \quad -9$ Subtract 9 from both sides

$(-3)\left(\frac{n}{-3}\right) = -3(-3)$ Multiply both sides by -3 and simplify

$n = 9$

5) $4x - x - 5 = 7$

$3x - 5 = 7$ Simplify left side of equation

$+5 \quad +5$ Add 5 to both sides

$\frac{3x}{3} = \frac{12}{3}$ Divide both sides by 3 and simplify

$x = 4$

PRACTICE PROBLEMS

Simplify:

1) $6-16$

2) $-6+9$

3) $6+(-9)$

4) $-4-4$

5) $-4-(-4)$

6) $7-(-5)$

7) $-8+(-3)$

8) $36+(+2)$

9) $-8-(+1)$

10) $-2+5-4$

11) $-5+(-3)+6$

12) $2+5y+8$

13) $3+4+2w$

14) $a+2+b+5$

15) $4+6xy+2=3xy$

16) $-8-2x+2$

17) $-5a-3a-2-1$

18) $3y-(-7)-y+6$

19) $-[6+(-1)]+(-c)$

20) $50-(45-5)$

21) $-3+(-9)+7$

22) $(2-7)-(-12+15)$

23) $18-10\div(3+2)$

24) $3[20-(5+3)]$

25) $(125-150)-(20-45)$

26) $2y-5-5y+3$

27) $11a-11-5a+5$

28) $3(20a)$

29) $(5x)(-6y)$

30) $(6x)(y)(4z)$

31) $(-2)(-3)$

32) $8(-4)$

33) $(-2)(5)(-8)$

34) $5(-2)(-1)(-3)$

35) $5(-2)-(-1)$

36) (-6a)(-5b)

37) $3y+(-7y)$

38) $2(x+3)$

39) $5(n-1)$

40) $5(2x+4)$

41) $3(2x-3y)$

42) $-6(x-2y)$

43) $2-5(x+2)$

44) $3x-5(x-1)$

45) $4+3(x-6)-5$

46) $-4[3(x-6)+2]-(-2)$

47) $(3x+10)-2(x+10)$

48) $(x+3)+(x+3)$

49) $(-16x-2y)+(-3x+7y)$

50) $(-9y+7y+7)-(6x-2y-7)$

Practice Problems:

Use inverse operations to solve each equation. Show all work. (DO NOT SOLVE MENTALLY).

1. $d-9=11$
2) $a+14=5$
3) $n-(-4)=12$
4) $x-27=-54$
5) $7-y=11$
6) $5x=-20$
7) $n+(-4)=-10$
8) $-10y=5$
9) $\frac{c}{6}=-4$
10) $-20=\frac{n}{5}$
11) $\frac{-x}{3}=15$
12) $\frac{2n}{3}=4$
13) $\frac{-5}{8}n=-10$
14) $\frac{-1}{3}y=7$
15) $x+5+(6-2)=10$
16) $2a+3a=20$
17) $-3n+9n=24$
18) $y-4y=-18$
19) $2(x-3)=10$
20) $3y+2=17$
21) $2x-3=15$
22) $\frac{1}{3}x+5=7$
23) $3(a-1)+5=32$
24) $\frac{x-1}{2}=5$
25) $-3=7(h-2)+11$

Evaluate each expression if: $x=-2$, $y=5$ and $z=-3$

1) $3xy$
2) $3x^2$
3) $-3x^2$
4) $-3x^2z$
5) $x-y-z$
6) $y+z+9-2)$
7) $-1+(-x)+(-y)$
8) $-(-x)-(-y)$
9) $2x-3z$
10) $\frac{2x-y}{z}$
11) $2x+5$
12) $2(x+5)$

Simplify. When appropriate, leave all answers as <u>improper fractions</u> in simplest form. NO CALCULATOR!!
To be successful in honors math, all students must be able to find the answer using mental math or paper/pencil.

1. $\frac{36}{12}$
2. $\frac{33}{9}$
3. $\frac{500}{5000}$
4. $\frac{3}{12}$
5. $\frac{24}{7}$
6. $\frac{15}{60}$
7. $4\frac{1}{6}+3\frac{5}{6}$
8. $\frac{7}{8}+\frac{2}{8}+\frac{1}{8}$
9. $\frac{2}{3}+\frac{3}{4}$
10. $\frac{2}{3}+\frac{4}{5}$
11. $\frac{8}{12}-\frac{2}{12}$
12. $\frac{3}{4}-\frac{5}{8}$
13. $9\frac{1}{4}-\frac{1}{2}$
14. $6\frac{4}{5}-5\frac{4}{5}$
15. $\frac{5}{2}\times\frac{6}{4}$
16. $2\frac{1}{3}\times\frac{6}{5}$
17. $\frac{2}{5}\times\frac{3}{16}$
18. $\frac{3}{8}\times 12$
19. $100\div\frac{1}{3}$
20. $\frac{2}{5}\div\frac{7}{5}$
21. $2\frac{1}{5}\div 5$
22. $3\div 1\frac{1}{2}$