Simplify the assigned set of problems. Do **NOT** work ahead. Work should be completed on this paper. If there are two more operations, multiple steps should be shown.

Set A

1. $aaaaa$

   $\boxed{a^5}$

2. $4x + (6x + 2y) + (2x + 7y)$

   $\boxed{-5y}$

3. $7b^2 \cdot b^5$

   $\boxed{7b^7}$

4. $2x^3 \cdot 7x^3$

   $\boxed{14x^6}$

5. $3v - [7w + 8v + (7v + 4w)]$

   $3v + (-11w + +15v)$

   $\boxed{18v + -11w}$

6. $(z^8)^5$

   $\boxed{z^{40}}$

7. $(3a^2)^4$

   $\boxed{81a^8}$

8. $(9xy)^2(3x^3y^3) + 3(xy)^4(2xy)$

   $81x^2y^2 \cdot 3x^3y^3 + 3x^4y^4 \cdot 2xy$

   $243x^5y^5 + 6x^5y^5$

   $\boxed{249x^5y^5}$

9. $-7x(5x + 4y)$

   $\boxed{-35x^2 + 28xy}$

10. $-3t(4t + 7u)$

    $\boxed{-12t^2 + -21tu}$

11. $(7a^5)(2a)^2(5a^2) + (3a^3)(9a^3)^2$

    $7a^5 \cdot 4a^2 \cdot 5a^2 + 3a^3 \cdot 81a^6$

    $140a^9 + 243a^9$

    $\boxed{383a^9}$

12. $(3x + 2)(x - 9)$

    $3x^2 + -27x + 2x + -18$

    $\boxed{3x^2 + -25x + -18}$

Set B

1. $3a^2 \cdot a^3$

   $\boxed{3a^5}$

2. $a + (3a + 2b) + (4a + 3b)$

   $\boxed{b}$

3. $4y^2 \cdot y^5$

   $\boxed{4y^7}$

4. $(u^7)^{10}$

   $\boxed{u^{70}}$

5. $3c + (7d + 4c) + (7c + 9d)$

   $\boxed{14c + -16d}$

6. $(y^6)^4$

   $\boxed{y^{24}}$

7. $-3a(2a + 3b)$

   $\boxed{-6a^2 + -9ab}$

8. $(4ab)^2(2a^2b^2) + 2(ab)^3(4ab)$

   $16a^2b^2 \cdot 2a^2b^2 + 2a^3b^3 \cdot 4ab$

   $32a^4b^4 + 8a^4b^4$
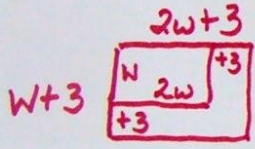
   $\boxed{40a^4b^4}$

9. $-4m(2m + 3n)$

   $\boxed{-8m^2 + 12mn}$

11. $(7mn)^2(2m^2n^2) + 4(mn)^3(3mn)$

12. $(3x + 5)(x + 2)$

Area Problems; #1   Name: _____

Example:

$w = width$ add ↓

A rectangle is twice as long as it is wide. If both of the dimensions are increased by 3m, its area is increased by 117m². Find its original dimensions.

$2w+3$

$w+3$ [$2w$] $+3$

$+3$

$\boxed{12 \times 24\ m}$

small + 117 = Big

$w \cdot 2w + 117 = (w+3)(2w+3)$

$2w^2 + 117 = 2w^2 + 3w + 6w + 9$

$108 = 9w$

$w = 12$

$2 \cdot 12 = 24$

Problem for practice:

A rectangle is three times as long as it is wide. If both of the dimensions are increased by 4cm, its area is increased by 176cm². Find its original dimensions.

Growing, Growing, Growing: Investigation 2

1. Ghost Lake is a popular site for fisherman, campers, and boaters. In recent years, a certain water plant has been growing on the lake at an alarming rate. The surface area of Ghost Lake is 25,000,000 square feet. At present, 1,000 square feet are covered by the plant. The Dept. of Natural Resources estimates that the area is doubling every month.

A) 1. Explain what information the variables and numbers in the situation represent.

Numbers: $(25,000,000 : \text{Total})$ $1000 : \text{Starting} \#$ $2 : \text{Growth factor}$

Variables: $\#$ of months (x) plant area (y)

2. Write an equation that represents the growth pattern of the plant on Ghost Lake (Let m = # of months and a = the plant area)

$$a = 1000 \cdot 2^x$$

3. How does this compare to the equation for yesterday's bacteria growth problem?

the start # is different (bigger) ; the

growth Factor is different. (smaller)

B) Make a table and a graph of the equation. (Use x-intervals of 1 and y-intervals of 1,000.)

#Months	Area (1000 sq ft)
0	1
1	2
2	4
3	8
4	16

$\cdot 2$
$\cdot 2$

Affect of time on Plant Area

Plant Area (1000 Ft²)

16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

0   1   2   3   4

# of Month

C) How much of the lake's surface will be covered with the water plant by the end of a year? (Show your work.)

$$1000 \cdot 2^{12} = 4,096,000 \text{ Ft}^2$$

D) In how many months will the plant completely cover the surface of the lake? 15 months