Algebra 2 Notes

Name: _key_

Section 1.1 – Simplifying Algebraic Expressions

BACKGROUND SKILL: Identify if the following are LIKE or UNLIKE terms.

$4xy^2$ and $-7xy^2$	$2y^2x$ and $2x^2y$	1 and -8	$3x$ and $(\sqrt{5})x$
LIKE	UNLIKE	LIKE	LIKE

Example 1: Simplify each expression. HINT – add the like terms!

a. $x^2 + 5x + 2y + 7x^2$

$1x^2 + 7x^2 + 5x + 2y$

$\boxed{8x^2 + 5x + 2y}$

b. $b(5a^2 - 2a) - 11a^2b + 2ab$

$5a^2b - 2ab - 11a^2b + 2ab$

$5a^2b - 11a^2b - 2ab + 2ab$

$-6a^2b + 0ab$

$\boxed{-6a^2b}$

c. $-3(2x - xy + 3y + 5) - 11xy - 2$

$-6x + 3xy - 9y - 15 - 11xy - 2$

$-6x + 3xy - 11xy - 9y - 15 - 2$

$\boxed{-6x - 8xy - 9y - 17}$

Example 2: Evaluate each expression for the given values of the variables.

a. $x + 3xy - 2y$ for $x = 4$ and $y = 7$

$4 + 3(4)(7) - 2(7)$

$4 + 12(7) - 14$

$4 + 84 - 14$

$88 - 14$

$\boxed{74}$

b. $x^2y - xy^2 - 5x + 3y$ for $x = 2$ and $y = 5$

$(2)^2(5) - (2)(5)^2 - 5(2) + 3(5)$

$4 \cdot 5 - 2 \cdot 25 - 10 + 15$

$20 - 50 - 10 + 15$

$-30 - 10 + 15$

$-40 + 15$

$\boxed{-25}$

c. $b^2z - 2bz + z^2$ for $b = 6$ and $z = -2$

$(6)^2(-2) - 2(6)(-2) + (-2)^2$

$36(-2) - 12(-2) + 4$

$-72 + 24 + 4$

$-48 + 4$

$\boxed{-44}$

Example 3: Write an algebraic expression to represent each situation.

a. the distance remaining for a runner after m miles of a 26.2-mile marathon $26.2 - m$	b. the number of hours it takes to fly 1800 miles at an average rate of n miles per hour $\dfrac{1800}{n}$
c. Lucy's age y years after her 18th birthday $18 + y$	d. the number of seconds in h hours 60 seconds in 1 minute 60 min in 1 hour so 3600 seconds in 1 hour $3600h$

Example 4: Transportation Application

Holly's hybrid car gets 45 miles per gallon on the highway and 25 miles per gallon in the city.

(a) Write and simplify an expression for the total number of miles she can drive if her fuel tank holds 15 gallons of gas.

→ h = # gallons used on highway
$15 - h$ = # gallons used in city

Total # miles she can drive:

$45(h) + 25(15-h)$
$45h + 375 - 25h$
$\boxed{20h + 375}$

(b) How many total miles can she drive on one tank of gas if she uses 5 gallons on the highway?

$h = 5$

$20(5) + 375$
$100 + 375$

$\boxed{475 \text{ miles}}$

Example 5: Commission Application

A travel agent is selling 100 discount packages. He makes $50 for each Hawaii package and $80 for each Cancun package.

(a) Write an expression to represent the total the agent will make selling a combination of the two packages.

→ H = # Hawaii packages
$100 - H$ = # Cancun packages

Total $ made:

$50H + 80(100 - H)$
$50H + 8000 - 80H$
$\boxed{8000 - 30H}$

(b) How much will he make if he sells 28 Hawaii packages?

$H = 28$

$8000 - 30(28)$
$8000 - 840$

$\boxed{\$7,160}$