Combining Terms

Last lesson we reviewed exponent laws for x/ ÷ … Now we look at ±

Notice the difference between

$(6x)(7x)(5x)$	$6x + 7x + 5x$
$= (6)(7)(5)x^3$ or $210x^3$	$= (6 + 7 + 5)x$ or $18x$
the exponent changes to 3	the x remains a x and only the coefficient changes

When added or subtracting terms – we can only combine like terms

These work: $6x^2 + 8x^2 = 14x^2$, $18xy - 14yx = 4xy$, $10x^2y + 4x^2y = 14x^2y$

These don't $6x^2y + 7xy^2$, $10xy - 7x + 9y$, $7x^3 + 4x^2$

1) Simplify the following (write in descending powers of x)

a) $5x^2 - 9x + 19 - 7x + 11x - 3x^2$

$= (5 - 3)x^2 + (-9 - 7 + 11)x + 19$

$= 2x^2 - 5x + 19$

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b) $18xy - 15x^2 - 19y^2 + 12x^2 - 13yx - 4x^2 + 9y^2 - 11x^2$

$= (-15 + 12 - 4 - 11)x^2 + (18 - 13)xy + (-19 + 9)y^2$

$= -18x^2 + 5xy - 10y^2$

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c) $(9x^7)(7x^6) - 5x(12x^{12}) - 16x(3x^2)$

$= 63x^{13} - 60x^{13} - 48x^3$

$= 3x^{13} - 48x^3$

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d) $(6x^2 - 17x + 5) + (12x^2 - 18x - 17) - (15x^2 + 9x - 10)$

for + the brackets make the question look nice, for – the signs need to change (group the terms when you rewrite it)

$6x^2 + 12x^2 - 15x^2 - 17x - 18x - 9x + 5 - 17 + 10$

$= 3x^2 - 44x - 2$

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e) $10x^3y^2 - 18x^2y^3 + 17y^3x^2 - 11x^3y^2 + 4y^2x^3 - 16x^3y$

too be a like term the variables and exponents MUST match (their order is not important)

$= (10 - 11 + 4)x^3y^2 + (-18 + 17)x^2y^3 - 16x^3y$

$= 3x^3y^2 - x^2y^3 - 16x^3y$

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2) Evaluate if x = -4 and y = 3

a) $4xy - 3x^2 + 5x^2 - 10xy$

well I'm not subbing in 4 times … I'll simplify first

$2x^2 - 6xy$

$2(-4)^2 - 6(-4)(3)$

$2(16) + 72 \quad = 104$

b) $3x^2y - 19xy^2 + 16y^2x + 2x^2y$

$5x^2y - 3xy^2$

$5(-4)^2(3) - 3(-4)(3)^2$

$5(16)(3) - 3(-4)(9)$

$240 + 108 \quad = 348$

Assignment = worksheet

Like terms, combining and evaluating … a review

1) Combine the following

a) $8x + 4x – 19x – 12x$ *b)* $-7a – a – 12a$ *c)* $-3p^2 + 8p – 6p^2$

d) $32m^2 – 17m – 6m$ *e)* $-65x^2 + 3x – 27x$ *f)* $-18n -24n + 20n^2$

g) $3x – 5y + 2x -7y – 6y + 3z$ *h)* $-2b – 5a + 3b – 7c – c$ *i)* $9x^2(-6x^2y)$

j) $2xy – 3x^2y + 10yx – 3y^2x + 2x^2y – 7xy^2$ *k)* $9xy^2 + 6xy – 8xy^2 + 6x^2y^2 – 6yx$

l) $(5x + 6) – (7x – 9) + (4x – 11) – (3x – 1)$ *m)* $(9x^2 – 7x + 3) – (2x^2 – 8x – 7)$

2) Evaluate the following if $x = -3$, $y = 2$, $z = -1$

a) $9x^2yz$ *b)* $-4xy^3z^2$ *c)* $-x^3y^3z^7$

d) $-3x^2 – 8x + y$ *e)* $4y^2 – 9x$ *f)* $4x – y – 5z$

What did the Martian say when he accidently landed on Venus?

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

T $5x^2 + 2x^2 - 3x^2$

S $4x^3 + x^2 + 4x$

L $-3x^3 + 5x^2 - 3x^3$

I $(3a)(a^2)(a^3) + (2a^2)(a^4)$

T $(a^4)(5a)(a^2) + (-4a^3)(2a^3)(a)$

W $(2a^3)(a^2)(3a^2) + (8a^2)(-a^2)(a)$

H $(2ab^2)(-2a^2b^2) - (ab^3)(6a^2b)$

N $(-a^2b)(ab^2)(a^2b^2) + (a^3b^2)(-a^2b^3)$

P $(4a^2b^2)(-3b^3) - (2ab^2)(-6ab^3)$

N $(5x^2)(2x^2)(-3x^2)$

I $(4x^3)(x^2)(4x)$

A $(-3x^3)(5x^2)(-3x^3)$

T $(3x)(2y)$

D $(7xy^2)(-2xy^2)$

A $(7x^2y)(-2xy^2)$

I $7x^2y - 2xy^2$

Y $7xy^2 - 2xy^2$

D $(5a^2)(2ab) + (a^2b)(3a)$

E $3x + 2y$

ANSWERS

(19) $5xy^2$

(1) $16x^6$

(11) $3x + 2y$

(15) $7x^2y - 2xy^2$

(13) $4x^2$

(16) $4x^3 + x^2 + 4x$

(18) $45x^8$

(9) $-14x^3y^3$

(5) $-30x^6$

(2) $-14x^2y^4$

(6) $6xy$

(8) $-6x^3 + 5x^2$

(10) $-2a^5b^5$

(4) $13a^3b$

(12) $-3a^7$

(7) 0

(14) $-10a^3b^4$

(3) $5a^6$

(17) $6a^7 - 8a^5$