Curriculum Outcome

- ☑ (PR 5)Demonstrate an understanding of polynomials (limited to of degree less than or equal to 2).
- ☑ (PR 6) Model, record and explain the operations of addition and subtraction of polynomial expressions, concretely, pictorially and symbolically (limited to polynomials of degree less than or equal to 2).
- ☑ (PR 7) Model, record and explain the operations of multiplication and division of polynomial expressions (limited to polynomials of degree less than or equal to 2) by monomials, concretely, pictorially and symbolically.

Student Friendly:
“Getting ready for your Polynomials test "

Warm Up
Grade 9

Determine the product or the quotient.

a) $(9r^3xy)(4r^2y - 2x)$

b) $(-7m^4n^2 + 2mn - 10n^2)(-3mn)$

c) $\dfrac{80t^5 + 14t^4 - 18t}{-2t}$

d) $(-12x^2 + 6x - 5) + (4x^2 - 8x - 1)$

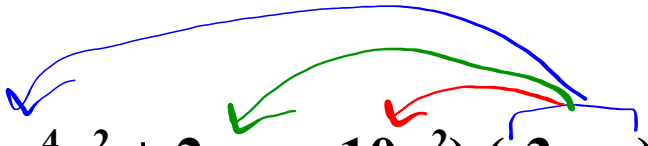
e) $(3x^2 - 12x + 7) - (5x^2 - 12x - 8)$

Warm Up
Grade 9

Determine the product or the quotient.

a) $(9r^3xy)(4r^2y - 2x)$

$36\ r^5xy^2 - 18r^3x^2y$



b) $(-7m^4n^2 + 2mn - 10n^2)(-3mn)$

$21m^5n^3 - 6m^2n^2 + 30mn^3$

c) $\frac{80t^5 + 14t^4 - 18t}{-2t}$

$\frac{80t^5}{-2t} + \frac{14t^4}{-2t} - \frac{18t}{-2t}$

$-40t^4 - 7t^3 + 9$

e) $(-12x^2 + 6x - 5) + (4x^2 - 8x - 1)$

$-12x^2 + 6x - 5 + 4x^2 - 8x - 1$

$-12x^2 + 4x^2 + 6x - 8x - 5 - 1$

$-8x^2 - 2x - 6$

d) $(3x^2 - 12x + 7) - (5x^2 - 12x - 8)$

$3x^2 - 12x + 7 - 5x^2 + 12x + 8$

$3x^2 - 5x^2 - 12x + 12x + 7 + 8$

$-2x^2 + 15$

MATH 9 SKILLS CHECKLIST **NAME:**_____
UNIT 4 – POLYNOMIALS
M. Burns

GENERAL CURRICULUM OUTCOME (GCO): **Patterns and Relations (PR) – Represent algebraic expressions in multiple ways.**

SPECIFIC CURRICULUM OUTCOMES (SCOs): **PR5, PR6 and PR7**

_____ **1.** **(PR5) Demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2).**

ACHIEVEMENT INDICATORS:

_____ **Create a concrete model or a pictorial representation for a given polynomial expression.**

Ex.: Model $3x^2 + 4$ using algebra tiles. **MODEL:** 

_____ **Write the expression for a given model of a polynomial.**

Ex.: Identify the polynomial represented by the following collection of algebra tiles: 

ANSWER: $-3x^2$

_____ **Identify the variables, degree, number of terms and coefficients, including the constant term, of a given simplified polynomial expression.**

Ex.: $4m^2 - n - 7$

VARIABLES:	m and n	NUMERICAL COEFFICIENTS:	4 and -1
DEGREE:	2	CONSTANT TERM:	-7
NUMBER OF TERMS:	3		

_____ **Describe a situation for a given first degree polynomial expression.**

Ex.: Let "x" represent the height of a student.
Ex.: Let "2a" represent the length of one side in an equilateral triangle.

_____ **Match equivalent polynomial expressions given in simplified form.**

Ex.: $4x - 3x^2 + 2$ is equivalent to $-3x^2 + 4x + 2$

2. (PR6) Model, record and explain the operations of addition and subtraction of polynomial expressions concretely, pictorially and symbolically (limited to polynomials of degree less than or equal to 2).

ACHIEVEMENT INDICATORS:

_____ **Identify like and unlike terms.**

Ex.: From the list, which terms are "like" $8x^2$?

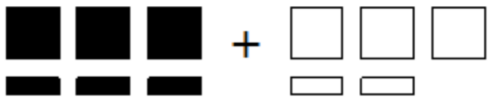
$-3x$; $5x^2$; 4 ; $3x$; 9 ; $-11x^2$; $7x$; -3

ANSWERS: $5x^2$ and $-11x^2$

_____ **Model addition of two given polynomial expressions concretely or pictorially and record the process symbolically.**

Ex.: Use algebra tiles to model the sum of the binomials below then record your answer symbolically.

$(-3x^2 - 3x) + (3x^2 + 2x)$:



$= -3x^2 + 3x^2 - 3x + 2x$

$= -x$

_____ **Apply a personal strategy for addition and subtraction of given polynomial expressions and record the process symbolically.**

Ex.: $(-2a^2 + a - 1) - (a^2 - 3a + 5)$

$= (-2a^2 + a - 1) + (-a^2 + 3a - 5)$ **(ADD the OPPOSITE of each term in the 2nd polynomial.)**

$= -2a^2 + a - 1 - a^2 + 3a - 5$

$= -2a^2 - a^2 + a + 3a - 1 - 5$

$= -3a^2 + 4a - 6$

_____ **Identify the error(s) in a given simplification of a given polynomial expression.**

Ex.: A student incorrectly subtracted $(2x^2 + 5x + 10) - (x^2 - 3)$ like this:

$(2x^2 + 5x + 10) - (x^2 - 3)$

$= 2x^2 + 5x + 10 - x^2 - 3$

$= x^2 + 2x + 10$

Identify the errors and correct them.

ANSWER: The student forgot to add the opposite of the second polynomial, then grouped unlike terms (5x and -3). They should have done the following:

$(2x^2 + 5x + 10) - (x^2 - 3)$

$= (2x^2 + 5x + 10) + (-x^2 + 3)$

$= 2x^2 + 5x + 10 - x^2 + 3$

$= x^2 + 5x + 13$

3. **(PR7) Model, record and explain the operations of multiplication and division of polynomial expressions (limited to polynomials of degree less than or equal to 2) by monomials concretely, pictorially and symbolically.**

ACHIEVEMENT INDICATORS:

_____ **Apply a personal strategy for multiplication and division of a given polynomial expression by a given monomial.**

Ex.: $2x(-3x + 5)$
$= -6x^2 + 10x$

Ex.: $\frac{24d^2 - 12d}{-12d}$
$= -2d + 1$

_____ **Provide examples of equivalent polynomial expressions.**

Ex.: Are $5j^2 + 20$ and $5(j^2 + 4)$ equivalent expressions?

ANSWER: Yes, these are equivalent expressions because $5(j^2 + 4) = 5j^2 + 20$.

_____ **Identify the error(s) in a given simplification of a given polynomial expression.**

Ex.: A student incorrectly multiplied $-3d(-2d + 9)$ like this:

$-3d(-2d + 9)$
$= 6d - 27$

Identify and correct the errors.

ANSWER: The student did not multiply the variables in their work. They should have done the following:

$-3d(-2d + 9)$
$= 6d^2 - 27d$

Vocabulary

Variable
Expression
Term
Constant
Coefficient

Polynomial
Monomial
Binomial
Trinomial
Degree

Equivalent
Like Terms
Unlike Terms
Algebra Tiles

Lets do more review

1) **Write a polynomial that matched the description:**

Type: Trinomial
Variable": y
Degree: 8
Coefficient: 5, -2
Constant: -4

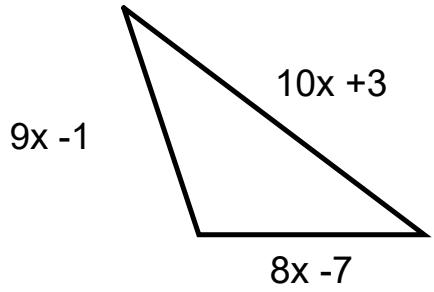
Answer:

$5y^8 - 2y^6 - 4$

2) **What do I add to $16x^2 + 2x - 1$ to get $18x^2 - 5x + 7$ as the result?**

$$16x^2 + 2x - 1$$
$$+ (2x^2 - 7x + 8)$$
$$18x^2 - 5x + 7$$

Given the following shape determine the perimeter.



$P = (10x + 3) + (9x-1) + (8x - 7)$

$P = 10x + 9x + 8x + 3 - 1 - 7$

$P = 27x - 5$

b) Determine the perimeter of the triangle when x = 2. (Show your work)

$P = 27x - 5$

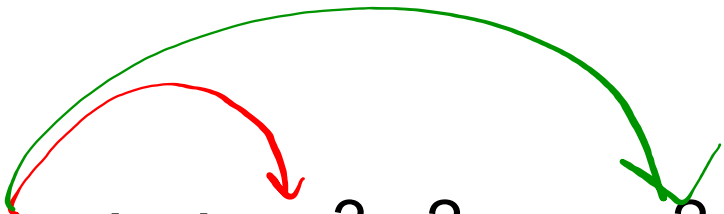
$P = 27(2) - 5$

$P = 54 - 5$

$P = 49$

$$(3x^2y)\ (-12xy)$$

$$-36x^3y^2$$



$$(5xy)\,(3x^3y^2 - 4x^2y^2)$$

$$5x^4y^3 - 20x^3y^3$$

$$(45x^5 - 72x) \div 9x$$

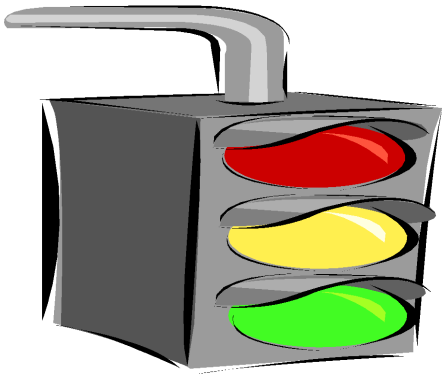
$$\frac{45x^5}{9x} - \frac{72x}{9x}$$

$$5x^4 - 8$$

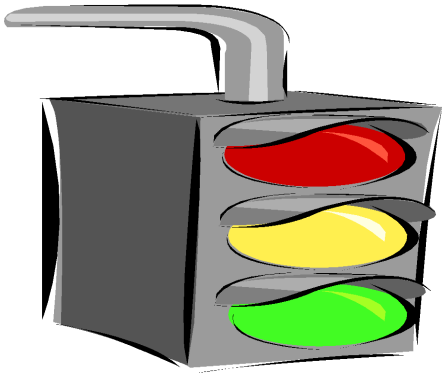
$$14x^5y^6 \div 2x^2y^6$$

$$\frac{14x^5y^6}{2x^2y^6}$$

$$7x^3$$



Now it is time for Home Learning



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2, 6 , 9, 10 , 11 , 12 a, d

15 a, c,e, g,h, 16 , 19 b

22 a,c,h,k,l, 24 a,

26 b,d,f,h, 28 b, d, f

29 a, b

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