Last Nights
Homework

You have until the end of class tomorrow to finish these questions

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Questions 3bd, 5a, 6,7a, 8, 9ab, 11bde, 12, 13bdf, 14, 15bdf, 16,cdg, 22bcd, 23cd

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Questions: 11,12,13,14,16acfh,19,20bcd, 21bcd, 22, 25

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Class/Homework

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#2
#6
#9
#10
#11
#12 a, d
#15 a, e, g,h
#16
#19 b
#22 a,c,h,k,l
#24 a
#26 a,c,e,g
#28 b, d, f
#29 a, b

Check Answers in
back of textbook

Pg 262
Questions 1 to 8

Feb 21-9:58 AM

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

Feb 7-8:58 PM

Warm Up
Grade 9

Determine the product or the quotient.

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

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

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

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

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2

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

$\dfrac{80t^5}{-2t}$ $\dfrac{+14t^4}{-2t}$ $\dfrac{-18t^1}{-2t^1}$

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

Jan 10-8:58 AM

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

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

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

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

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

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

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

$-2x^2 \qquad +15$

Dec 19-10:09 AM

Warm Up
Grade 9

Determine the product or the quotient.

a) $(9r^2xy)(4r^3y - 2x)$ b) $(-7m^4n^5 + 2mn -10n^2)(-3mn)$

$36r^5xy^2 - 18r^3x^2y$ $21m^5n^3 - 6m^2n^2 + 30mn^3$

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

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

$\boxed{-40t^4 - 7t^3 + 9}$

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

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

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

$\boxed{-2x^2 \quad +15}$

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

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

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

$\boxed{-8x^2 \quad -2x -6}$

Feb 7-8:58 PM

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.
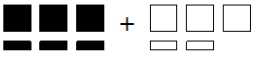
_____ Match equivalent polynomial expressions given in simplified form.

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

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_____ 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:

$(2x^2 + 5x + 10) - (x^2 - 3)$
= $(2x^2 + 5x + 10) + (-x^2 + 3)$
= $2x^2 + 5x + 10 - x^2 + 3$
= $x^2 + 5x + 13$

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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.: $2x(-3x + 5)$ Ex.: $\dfrac{24d^2 - 12d}{-12d}$

        $=$ $-6x^2 + 10x$ $= \quad -2d + 1$

_____ 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:

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

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VOCABULARY:

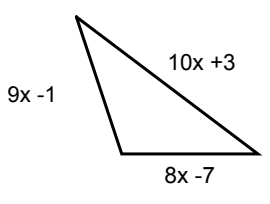|		
_____ variable	_____ polynomial	_____ equivalent polynomials
_____ expression	_____ monomial	_____ like terms
_____ term	_____ binomial	_____ unlike terms
_____ constant term	_____ trinomial	_____ algebra tiles
_____ (numerical) coefficient	_____ degree	

Dec 19-9:08 AM

Warm Up

a) Given the following shape determine the perimeter.

10x +3

9x -1

8x -7

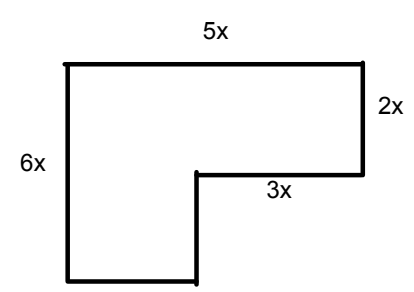b) Determine the perimeter of the triangle when x = 2. (Show your work)

$$P = 27x - 5$$

$$P = 27(2) - 5$$

$$P = 54 - 5$$

$$P = 49$$

Feb 21-9:46 AM

Warm Up

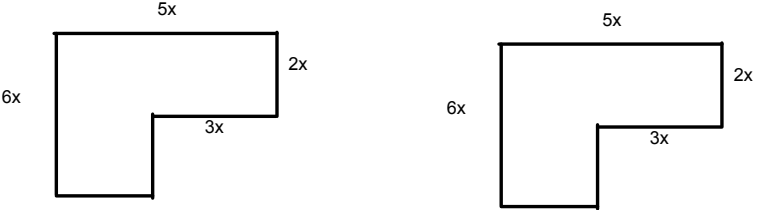a) Given the following shape determine the area.

5x

2x

6x

3x

b) Determine the area of the shape when x = 3. (Show your work)

Feb 21-9:46 AM

Warm Up

a) Given the following shape determine the area.

5x

2x

6x

3x

5x

2x

6x

3x

b) Determine the area of the shape when x = 3. (Show your work)

$$A = 18x^2$$
$$= 18(3)^2$$
$$= 18(9)$$
$$= 162$$

Feb 21-9:46 AM

Warm Up
Grade 9

1) Write a polynomial that matched the description:

variable": y,
Degree: 8
Trinomial
Constant: +4

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

$$16x^2 + 2x - 1$$
$$+ (\qquad\qquad)$$
$$\overline{18x^2 - 5x + 7}$$

Feb 21-9:49 AM

Add the following

$(5x^2 + 12x - 10) + (-7x^2 - 15x + 19)$

$5x^2 - 7x^2 \qquad + 12x - 15x \qquad -10 + 19$

$-2x^2 \quad - 3x \quad + 9$

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Subtract the following:

$(21y^2 - 10y + 14) - (2y + y^2 - 4)$

$21y^2 - 10y + 14 \quad -2y \quad - y^2 + 4$

$21y^2 - 1y^2 \qquad -10y - 2y \qquad + 14 + 4$

$20y^2 - 12y + 18$

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

$$= \quad -36x^3y$$

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

$$6x^4y^2 \quad - 8x^3y^3$$

Jan 12-10:05 AM

$$10 \div 2 = 5$$

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

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

$$\boxed{5x^4 \quad -8}$$

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$$\left(2x^3 + 4x\right) \div 4x^2$$

$$\frac{2x^3}{4x^2} + \frac{4x^1}{4x^2}$$

$$0.5x + 1x^{-1}$$

$$0.5x + \frac{1}{x^1}$$

Jan 12-8:54 AM

$$x^{-n} = \frac{1}{x^n}$$

Jan 12-10:15 AM

$$14x^3 y^6 \div 2x^2 y^6$$

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Class/Homework

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#6
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#10
#11
#12 a, d
#15 a, e, g,h
#16
#19 b
#22 a,c,h,k,l
#24 a
#26 a,c,e,g
#28 b, d, f
#29 a, b

.

Check Answers in back of textbook

Pg 262
Questions 1 to 8

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Wednesday (Extra practice 1-6)

Master 5.19   **Extra Practice 1**

Lesson 5.1: Modelling Polynomials

1. Identify the polynomials in the following expressions.
   a) $2m^2 + 1$ b) $3x^{\frac{1}{2}}$ c) $-4x$ d) $\frac{1}{x^2 + x}$ e) $0.25y^2$

2. Name the coefficients, variable, degree, and constant term of each polynomial.
   a) $-8y$ b) 12 c) $-2b^2 - b + 10$ d) $-4 - b$

3. Identify each polynomial as a monomial, binomial, or trinomial.
   a) $19t$ b) $g - 4g^2 + 5$ c) $-1 + xy + y^2$ d) $4 - 11w$

4. Identify the equivalent polynomials.
   a) $-h^2 - 3 + 4h$ b) $-3 + 4h - h^2$
   c) $5m - 3$ d) $-2 + y^2 + 5xy$
   e) $y^2 + 5xy - 2$ f) $-3 + 5m$

5. Use algebra tiles to model each polynomial. Sketch the tiles.
   a) $-5 + y^2$ b) $2x - 1$ c) $-3a^2 - 2a + 1$ d) $3z$ e) $v^2 - 4v$

6. Write a polynomial to match the following conditions.
   a) 2 terms, degree 1, with a constant term of 4
   b) 3 terms, degree 2, with the coefficient on the 2nd degree term -2

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(Master 5.20)   **Extra Practice 2**

Lesson 5.2: Like Terms and Unlike Terms

1. From the list, identify terms that are like $2w^2$. Explain how you know they are like terms.
$-5w, -6w^2, -2, 4w, 3w^2, -w^2, 11w, 2$

2. Simplify each polynomial.

a) $4 + x + 1 + 5x + 1$ b) $-3y^2 + 3y - 2$
c) $2x^2 + 8 - 11 - 4x^2 + 5x^2$ d) $3y + 7y^2 + 1 - y - 2y - 3y^2$

3. Simplify each polynomial.
a) $7d - 2d + 1 - 6$ b) $-5 - 3 - k - 5k$
c) $-4 + 2a + 7 - 4a$ d) $3p - 6 - 4p + 6$

4. Simplify each polynomial.
a) $3a^2 - 2a - 4 + 2a - 3a^2 + 5$ b) $7z - z^2 + 3 + z^2 - 7$
c) $d^2 + 3d + 1 + 4d^2 + 2$ d) $-6x^2 + 10x - 4 + 4 - 12x - 7x^2$

5. Identify the equivalent polynomials. Justify your responses.
a) $-5y^2 - 3y - 4$ b) $10x - 1$
c) $1 + x - x^2$ d) $2y^2 - 4 - 16 - 7y^2 - 3y + 16$
e) $-7 + 5x - 7x - 8 + 14 + 12x$ f) $5x^2 + 7 + 4x - 6x^2 - 6 - x - 2x$

6. Write a polynomial to represent the perimeter of each rectangle.
a)

b)

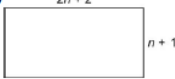(Master 5.21)   **Extra Practice 3**
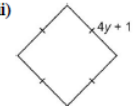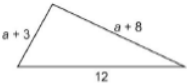
Lesson 5.3: Adding Polynomials

1. Add these polynomials.
a) $(-4h + 1) + (6h + 3)$ b) $(2a^2 + a) + (-5a^2 + 3a)$
c) $(3y^2 - 2y + 5) + (-y^2 + 6y + 3)$ d) $(3 - 2y + y^2) + (-1 + y - 3y^2)$

2. Add these polynomials.
a) $(x - 5) + (2x + 2)$ b) $(b^2 + 3b) + (b^2 - 3b)$
c) $(y^2 + 6y) + (-7y^2 + 2y)$ d) $(5n^2 + 5) + (-1 - 3n^2)$

3. Add these polynomials..
a) $(-7x + 5)$ b) $(4x^2 - 3)$
    $+ \underline{(2x - 8)}$ $+ \underline{(-8x^2 - 1)}$

c) $(x^2 - 4x + 3)$ d) $(3x^2 - 4x + 1)$
    $+ \underline{(-x^2 - 2x - 3)}$ $+ \underline{(-2x^2 + 4x + 1)}$

4. Add.
a) $(y^2 + 6y - 5) + (-7y^2 + 2y - 2)$ b) $(-2n + 2n^2 + 2) + (-1 - 7n^2 + n)$
c) $(3m^2 + m) + (-10m^2 - m - 2)$ d) $(-3d^2 + 2) + (-2 - 7d^2 + d)$

5. a) For each shape below, write the perimeter as a sum of polynomials and in simplest form.
i) $2n + 2$ ii)
                  $3p + 4$

$n + 1$

iii)   iv)
     $4y + 1$ $a + 3$ $a + 8$
                     12

b) Use substitution to check each answer in part a.

6. The sum of two polynomials is $4r + 5 - 3r^2$. One polynomial is $-8 - 2r^2 + 2r$; what is the other polynomial? Explain how you found your answer.

(Master 5.22)   **Extra Practice 4**

Lesson 5.4: Subtracting Polynomials

1. Simplify the following
   a) $(4x + 2) - (2x + 1)$ b) $(4x + 2) - (-2x + 1)$
   c) $(4x + 2) - (2x - 1)$ d) $(4x + 2) - (-2x - 1)$

2. Simplify the following
   a) $(2s^2 + 3s + 6) - (s^2 + s + 2)$ b) $(2s^2 + 3s - 6) - (s^2 + s - 2)$
   c) $(-2s^2 + 3s + 6) - (-s^2 + s + 2)$ d) $(2s^2 - 3s + 6) - (s^2 - s + 2)$

3. Simplify the following
   a) $(2x + 3) - (5x + 4)$ b) $(4 - 8w) - (7w + 1)$
   c) $(x^2 + 2x - 4) - (4x^2 + 2x - 2)$ d) $(-9z^2 - z - 2) - (3z^2 - z - 3)$

4. A student subtracted
   $(3y^2 + 5y + 2) - (4y^2 + 3y + 2)$ like this:
   $= 3y^2 - 5y - 2 - 4y^2 - 3y - 2$
   $= 3y^2 - 4y^2 - 5y - 3y - 2 - 2$
   $= -y^2 - 8y - 4$
   a) Explain why the student's solution is incorrect.
   b) What is the correct answer? Show your work.

5. The difference between two polynomials is $(5x + 3)$. One of the two polynomials is
   $(4x + 1 - 3x^2)$. What is the other polynomial? Explain how you found your answer.

6. Subtract.
   a) $(mm - 5m - 7) - (-6n + 2m + 1)$
   b) $(2a + 3b - 3a^2 + b^2) - (-a^2 + 8b^2 + 3a - b)$
   c) $(xy - x - 5y + 4y^2) - (6y^2 + 9y - xy)$

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(Master 5.23)   **Extra Practice 5**

Lesson 5.5: Multiplying and Dividing a Polynomial by a Constant

1. Multiply. Sketch the tiles for one product.
   a) $2(3b)$ b) $-2(6h)$ c) $4(2b^2)$
   d) $-2(2x^2)$ e) $-2(-y^2)$ f) $-3(-2f)$

2. Divide. Sketch the tiles for one division statement.
   a) $12d \div 4$ b) $-20d \div 5$ c) $8d \div -4$
   d) $12y^2 \div 4$ e) $-14x^2 \div 2$ f) $-10q \div -5$

3. Determine each product.
   a) $4(3a + 2)$ b) $(d^2 + 2d)(-3)$
   c) $2(4c^2 - 2c + 3)$ d) $(-2n^2 + n - 1)(6)$
   e) $-3(-5m^2 + 6m + 7)$

4. Here is a student's solution for a multiplication question.
   $(-5k^2 - k - 3)(-2)$
   $= -2(5k^2) - 2(k) - 2(3)$
   $= -10k^2 - 2k - 6$
   a) Explain why the student's solution is incorrect.
   b) What is the correct answer? Show your work.

5. Determine each quotient.
   a) $(16v + 16) \div (8)$ b) $(25k^2 - 15k) \div (5)$
   c) $(20 - 8n) \div (-4)$ d) $(18x^2 - 6x + 6) \div (6)$
   e) $(7 - 7y + 14y^2) \div (-7)$

6. Here is a student's solution for a division question.
   $(-12r^2 - 8r - 16) \div (-4)$
   $= \dfrac{-12r^2}{4} + \dfrac{-8r}{4} + \dfrac{-16}{4}$
   $= -3r^2 - 2r + 4$
   a) Explain why the student's solution is incorrect.
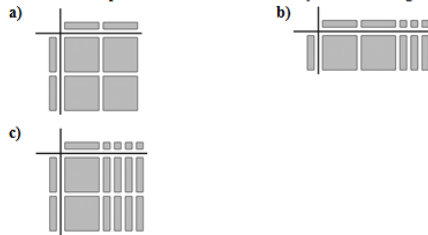   b) What is the correct answer? Show your work.

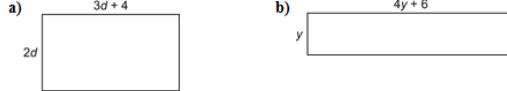Dec 19-9:15 AM

(Master 5.24)   **Extra Practice 6**

Lesson 5.6 Multiplying and Dividing a Polynomial by a Monomial

1. Write the multiplication sentence modelled by each set of algebra tiles.
   a)
   b)

   c)

2. For each set of algebra tiles in question 1, write a division sentence.

3. Write the multiplication sentence modelled by each rectangle.
   a)

$3d + 4$

   $2d$

   b)

$4y + 6$

   y

4. For each rectangle in question 4, write a division sentence.

5. Multiply.
   a) $v(3v + 1)$ b) $3c(5c + 2)$ c) $(8 + 4y)(6y)$
   d) $5p(-5 - 2p)$ e) $(7k - 3)(-m)$ f) $(-1 - 10r)(-r)$
6. Divide.
   a) $(6x + 3) \div 3$ b) $(14w - 7) \div -7$ c) $(-15 - 10q) \div 5$
   d) $(8z^2 + 4z) \div 2z$ e) $(12c^2 - 6c) \div 3c$ f) $(9xy - 6x) \div -3x$

7. Here is a student's solution for a division question.
   $(-12x^2 - 9x - 12xy) \div (-3x)$
   $= \dfrac{-12x^2}{-3x} + \dfrac{9x}{-3x} + \dfrac{-12xy}{-3x}$
   $= 4x^2 - 3 + 4xy$
   a) Explain why the student's solution is incorrect.
   b) What is the correct answer?

Jan 6-10:40 AM