

SHOW ALL OF YOUR WORK in the space provided. Take the time to check your work. Circle your final answers. Write neatly.

1. Find the sum or difference. Write your answer in standard form.

a. $(2x + 3y) + (4x - 9y)$

$$\boxed{6x - 6y}$$

combine
like
terms

b. $(x^2y - 3x^2 + y) + (3y + 2x^2y)$

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

K
C
S

$$\boxed{3x^2y - 3x^2 - 2y}$$

2. Simplify each expression. Write your answer in standard form.

a. $6m(-5 - m + 4m^2)$

Distribute

$$-30m - 6m^2 + 24m^3$$

$$\boxed{24m^3 - 6m^2 - 30m}$$

b. $4b(-5b - 3) - 2(b^2 - 7b - 4)$

$$-20b^2 - 12b - 6 - 2b^2 + 14b + 8$$

$$\boxed{-22b^2 + 2b + 2}$$

3. Find each product in standard form.

a. $(6a + 5)(a^2 - 5a + 3)$

$$\begin{array}{r} 6a^3 - 30a^2 + 18a \\ + \quad 5a^2 - 25a + 15 \\ \hline \boxed{6a^3 - 25a^2 - 7a + 15} \end{array}$$

b. $(8w + 4x)(8w - 4x)$

$$\begin{array}{r} 64w^2 - 32wx + 32wx - 16x^2 \\ \hline \boxed{64w^2 - 16x^2} \end{array}$$

c. $(3m - 4)^2$

$$\begin{array}{r} (3m - 4)(3m - 4) \\ 9m^2 - 12m - 12m + 16 \\ \hline \boxed{9m^2 - 24m + 16} \end{array}$$

4. Factor each polynomial.

GCF

a. $35x^2 - 28x$

$$\begin{array}{r} (7 \cdot 5)(x \cdot x) - (7 \cdot 4 \cdot x) \\ \hline \boxed{7x(5x - 4)} \quad \checkmark \end{array}$$

b. $121c^2v - 77c$

$$\begin{array}{r} (11 \cdot 11c)(1 \cdot v) - (11 \cdot 7 \cdot c) \\ \hline \boxed{11c(11cv - 7)} \end{array}$$

c. $(fg - 5g)(4f - 5)$

Grouping

$$\begin{array}{r} (f \cdot g) - (5g)(4f) - (4 \cdot 5) \\ g(f - 5) + 4(f - 5) \\ \hline \boxed{(f - 5)(g + 4)} \end{array}$$

5. Factor each quadratic trinomial, if possible. If the trinomial cannot be factored, identify it as "PRIME."

a. $y^2 - 6y + 17$

~~a.c~~
~~17~~
~~-6~~
~~b~~

PRIME

$\frac{17}{1 \cdot 17}$
 $-1 \cdot -17$

b. $n^2 - 2n - 35$

~~-35~~
~~-7~~
~~5~~
~~-2~~
 $(n^2 - 7n) + (5n - 35)$
 $n(n-7) + 5(n-7)$
 $(n-7)(n+5)$

$\frac{-35}{1 \cdot 35}$
 $-7 \cdot 5$

6. Factor each quadratic trinomial, if possible. If the trinomial cannot be factored, identify it as "PRIME."

a. $2x^2 + 11x - 6$

~~a.c~~
~~-12~~
~~-1~~
~~11~~

$(2x^2 - 1x) + (12x - 6)$
 $x(2x-1) + 6(2x-1)$
 $(2x-1)(x+6)$

$\frac{12}{-1 \ 12}$
 $2 \ 6$
 $3 \ 4$

b. $3x^2 + 10x + 8$

$\frac{24}{4 \ 6}$
 10

$(3x^2 + 4x) + (6x + 8)$
 $x(3x+4) + 2(3x+4)$
 $(3x+4)(x+2)$

$\frac{24}{1 \ 24}$
 $2 \ 12$
 $3 \ 8$
 $4 \ 6$

7. Sam is a consultant for a local museum. He is trying to help the museum make more revenue. He finds that the number of hours that the museum must stay open per day to make a profit is given by the expression $2h^2 - 2h - 24$. Factor the expression.

$(2h^2 - 2h - 24)$

$2(h^2 - h - 12)$

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

$(2h^2 - 8h) + 6h - 24$

$2h(h-4) + 6(h-4)$

$(2h+6)(h-4)$

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

~~-12~~
~~-4~~
~~3~~
~~-1~~

~~-8~~
~~-4~~
~~6~~
~~-2~~

8. OPTIONAL BONUS:

A square has an area of $9x^2 + 30xy + 25y^2$ square inches. Each side of the square can be represented by a binomial with positive integer coefficients. Write an expression to represent the perimeter of the square. Justify your answer.