

Simplify each sum. Write answer in standard form. Circle your answer.

$$1) \quad \underline{\underline{7n^3}} - \underline{3n} + 2 + \underline{\underline{-7n^2}} + 2 + \underline{\underline{8n^3}}$$

$$\boxed{15n^3 - 7n^2 - 3n + 4}$$

$$2) \quad \underline{\underline{-3a^3}} + \underline{4a^2} + \underline{a} + \underline{\underline{-4a^2}} - \underline{\underline{8a^3}} - \underline{5a}$$

$$\boxed{-11a^3 - 4a}$$

Simplify each difference. Rewrite as an addition problem. Write answer in standard form. Circle your answer.

$$3) \quad (6 + 5x^2 + 6x) - (-5x^3 + 4 + 7x) =$$

$$6 + \underline{5x^2} + \underline{6x} + \underline{\underline{5x^3}} - 4 - \underline{7x} =$$

$$\boxed{5x^3 + 5x^2 - x + 2}$$

$$4) \quad (-3p^3 + 3p^2 + 2p) - (3p^2 - 2p + p^3) =$$

$$\underline{\underline{-3p^3}} + \underline{3p^2} + \underline{2p} - \underline{\underline{3p^2}} + \underline{2p} - \underline{\underline{p^3}} =$$

$$\boxed{-4p^3 + 4p}$$

ALG.e

Date _____ Period _____

ALG.e.2

Multiply binomials. Clearly show all steps. Simplify. Write answer in standard form. Circle your answer.

1) $(3x - 3)(6x + 8)$

$$18x^2 + 24x - 18x - 24$$

$$\boxed{18x^2 + 6x - 24}$$

2) $(5a + 8)(5a - 8)$

$$25a^2 - 40a + 40a - 64$$

$$\boxed{25a^2 - 64}$$

3) $(7x + 2)^2 \xrightarrow{\text{EXPAND}} (7x + 2)(7x + 2) =$

$$49x^2 + 14x + 14x + 4 =$$

$$\boxed{49x^2 + 28x + 4}$$

Factor each completely. Clearly show your work. Circle your answer.

1) $n^2 + 8n + 12$

$$\begin{array}{r} 1 \ 12 \\ 2 \ 6 \\ 3 \ 4 \end{array}$$

$$(n+2)(n+6)$$

$$\underline{\text{OR}} \ (n+6)(n+2)$$

2) $n^2 - 8n + 12$

$$\begin{array}{r} 1 \ 12 \\ 2 \ 6 \\ 3 \ 4 \end{array}$$

$$(n-2)(n-6)$$

$$\underline{\text{OR}} \ (n-6)(n-2)$$

3) $x^2 - x - 20$

$$\begin{array}{r} 1 \ 20 \\ 2 \ 10 \\ 4 \ 5 \end{array}$$

$$(x+4)(x-5)$$

$$\underline{\text{OR}} \ (x-5)(x+4)$$

4) $4x^2 - 25$

PERFECT SQ - PERFECT SQ

$$(2x-5)(2x+5)$$

5) $4x^2 + 12x + 9$

PERFECT SQUARES

$$(2x+3)(2x+3) \quad \text{OR} \quad (2x+3)^2$$

ALG.e

DON'T FORGET TO
CHECK ALL SOLUTIONS IN
THE ORIGINAL EQUATION.

Date _____ Period _____

ALG.e.4

Factor and solve complex polynomials, involving at least three factors.

STEP 1 - ALWAYS
FACTOR OUT
GCF.

Clearly show all steps. Factor each completely. Then solve. Circle solutions.

1) $5x^3 + 75x^2 + 250x = 0$

$$5x(x^2 + 15x + 50) = 0$$

$$5x(x+10)(x+5) = 0$$

$$5x=0 \quad x+10=0 \quad x+5=0$$

$$\boxed{x=0} \quad \boxed{x=-10} \quad \boxed{x=-5}$$

2) $45x^4 - 5x^2 = 0$

$$5x^2(9x^2 - 1) = 0$$

$$5x^2(3x+1)(3x-1) = 0$$

$$5x^2=0 \quad 3x+1=0 \quad 3x-1=0$$

$$\boxed{x=0} \quad \boxed{x=-1/3} \quad \boxed{x=1/3}$$

3) $8x^5 - 8x^4 + 2x^3 = 0$

$$2x^3(4x^2 - 4x + 1) = 0$$

$$2x^2(2x-1)(2x-1) = 0$$

$$2x^2=0$$

$$\boxed{x=0}$$

$$2x-1=0$$

$$\begin{array}{r} +1 \quad +1 \\ \hline 2x = 1 \\ \frac{1}{2} \quad \frac{1}{2} \end{array}$$

$$\boxed{x=1/2}$$

4) $8x^3 - 10x^2 - 32x + 40 = 0$

FACTOR BY
GROUPING

$$2(4x^3 - 5x^2 - 16x + 20) = 0$$

$$2[x^2(4x-5) - 4(4x-5)] = 0$$

$$2[(4x-5)(x^2-4)] = 0$$

$$2(4x-5)(x+2)(x-2) = 0$$

$$2=0$$

$$\begin{array}{r} 4x-5=0 \\ +5 \quad +5 \\ \hline 4x = 5 \\ \frac{4}{4} \quad \frac{5}{4} \end{array}$$

$$\boxed{x=5/4}$$

$$x+2=0 \quad x-2=0$$

$$\boxed{x=-2} \quad \boxed{x=2}$$