

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

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

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

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

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

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

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

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

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

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

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

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

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) $n^2 + 8n + 12$

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

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

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

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

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

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

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

3) $x^2 - x - 20$

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

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

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

4) $4x^2 - 25$

PERFECT SQ - PERFECT SQ

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

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

PERFECT SQUARES

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

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.

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

STEP 1 - ALWAYS
FACTOR OUT
GCF.

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

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

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

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

$$x=0$$

$$x=-10$$

$$x=-5$$

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

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

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

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

$$x=0$$

$$x=-1/3$$

$$x=1/3$$

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

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

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

$$2x^2=0$$

$$x=0$$

$$2x-1=0$$

$$+1 \quad +1$$

$$\frac{2x}{2} = \frac{1}{2}$$

$$x=1/2$$

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

FACTOR BY
GROUPING

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

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

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

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

$$2=0$$

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

$$x=5/4$$

$$x+2=0$$

$$x=-2$$

$$x-2=0$$

$$x=2$$