Algebra 2 Honors **Name**_____
Warm Up: Post 3-4 **Date**_____ **Block**_____

1. Simplify: $(x - 7)(x^2 + 7x + 49)$

2. Factor *completely*: $x^3 + 3x^2 - 9x - 27$

3. Which is a factor of $x^3 + 2x^2 - 9x + 30$?

   A) $x + 2$
   B) $x - 3$
   C) $x + 5$
   D) $x - 6$

4. $P(x)$ is a polynomial, and $P(4) = P(-2) = P(-1) = 0$. Which of the following could be $P(x)$?

   A) $x^3 + 7x^2 + 14x + 8$
   B) $x^2 + 3x + 2$
   C) $-x^2 + 2x + 8$
   D) $x^3 - x^2 - 10x - 8$

3-4 Extension
What if grouping doesn't work?

Example: Factor *completely*.
$x^3 + 3x^2 - 28x - 60$

Additional Examples

In 1 – 2, factor completely.

1. $6x^3 - 19x^2 + x + 6$

2. $x^3 + 2x^2 - 11x - 12$

p. 178 #45

The profit of a small business (in thousands of dollars) since it was founded can be modeled by the polynomial $f(t) = -t^4 + 44t^3 - 612t^2 + 2592t$, where t represents the number of years since 1980.

a. Factor $f(t)$ completely.

b. What was the company's profit in 1985?

c. Find and interpret $f(15)$.

d. What can you say about the company's long-term prospects?

3-4 Challenge and Extend (select problems from p. 179)

1. Factor $(x-3)^3+8$ as the sum of two cubes. Then simplify each factor.

2. Factor $(2a+b)^3-b^3$ as the difference of two cubes. Then simplify each factor.

The polynomial au^2+bu+c is in quadratic form when u is any function of x. Identify u, and factor each expression, simplifying the factors if possible.

3. $x+3\sqrt{x}+2$

4. $(3x-8)^2+6(3x-8)+9$

5. $2x^{\frac{1}{2}}-2x^{\frac{1}{4}}-12$

6. $\frac{1}{2}\left(x-\frac{1}{3}\right)^2+\frac{5}{2}\left(x-\frac{1}{3}\right)-42$