Notes: Factoring Special Products

a) $48x^2y^6 - 16x^4y$	b) $2x^2 + 13x - 7$	c) $2x^3 + x^2 - 6x - 3$
$16x^2y(3y^5 - x^2)$	$(2x-1)(x+7)$	$(x^2-3)(2x+1)$

$(x+5)^2$

$x^2 + 2(x \cdot 5) + 5^2$

$x^2 + 10x + 25$

$x^2 - 16x + 64$

$x \cdot x$ $\quad 2(-8x)$ $\quad 8 \cdot 8$

$(x-8)^2$

$9x^2 + 30x + 25$

$3x \cdot 3x$ $\quad 2(15x)$ $\quad 5 \cdot 5$

$(3x+5)^2$

	Perfect Square Trinomial Ex: $x^2 + 6x + 9$	Contrast	Difference of Squares Ex: $4x^2 - 25$
Number of Terms	3	Number of Terms	2
Sign(s)	+ + or − +	Sign(s)	always −
Pattern	$x^2 + 6x + 9$; $x \cdot x$, $2(x \cdot 3)$, $3 \cdot 3$	Pattern	$4x^2 - 25$; $2x \cdot 2x$, $5 \cdot 5$
Factored Form	binomial squared $(x+3)(x+3) = (x+3)^2$	Factored Form	two binomials, opposite signs $(2x+5)(2x-5)$
Compare		Compare	

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

$x^2 - 5x + 5x - 25$

$x^2 - 25$

$9x^2 - 16$

$3x \cdot 3x$ $\quad 4 \cdot 4$

$(3x-4)(3x+4)$

$x^2 - 36$

$x \cdot x$ $\quad 6 \cdot 6$

$(x-6)(x+6)$

$121x^2 + 49$

Not Difference of Squares

NOT FACTORABLE

Identify each of the following as a perfect square trinomial, a difference of squares or neither.

1) $x^2 - 16$ — Dof S — $(x-4)(x+4)$

2) $x^2 - 14x + 49$ — PST — $(x-7)^2$

3) $100x^2 - 36$ — Dof S — $(10x-6)(10x+6)$

4) $x^2 - 14x + 49$ — Neither

5) $4x^2 - 12x - 9$ — neither

6) $x^2 + 10x + 25$ — PST — $(x+5)^2$

7) $25x^2 + 16$ — neither

8) $9x^2 - 12x + 16$ — $-24x$; $3x \cdot 3x$, $4 \cdot 4$ — neither

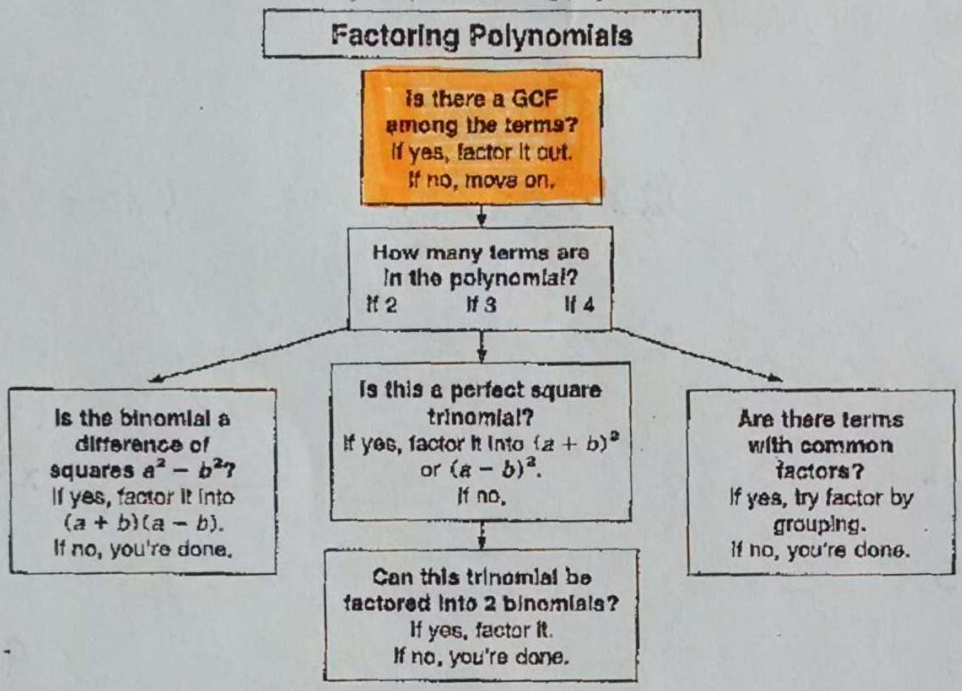
Factor each special product.

9) $16x^2 - 9$ — $(4x-3)(4x+3)$

10) $25x^2 - 40x + 16$ — $(5x-4)^2$

11) $x^2 - 144$ — $(x-12)(x+12)$

12) $121x^2 + 44x + 4$ — $(11x+2)^2$



a) $4x^6 - 20x^5 + 12x^4 - 60x^3$ $4x^3(x^3 - 5x^2 + 3x - 15)$ $(x^3 - 5x^2)(+3x - 15)$ $x^2(x-5) + 3(x-5)$ $4x^3(x^2+3)(x-5)$	b) $x^5 - 25x^3$ $x^3(x^2 - 25)$ $x^3(x-5)(x+5)$	c) $3x^2 - 15x + 18$ $3(1x^2 - 5x + 6)$ $(x^2 - 2x)(-3x + 6)$ $x(x-2) - 3(x-2)$ $3(x-3)(x-2)$ 6, -2, -3, -5
d) $8x^2 + 96x + 288$ $8(x^2 + 12x + 36)$ $8(x+6)^2$	e) $20x^3 + 5x$ $5x(4x^2 + 1)$	f) $144x^2 - 36$ $36(4x^2 - 1)$ $36(2x-1)(2x+1)$ $(12x-6)(12x+6)$ $6(2x-1) \cdot 6(2x+1)$ $36(2x-1)(2x+1)$
g) $4x^2 + 25x$ $x(4x + 25)$	h) $121x^2 + 44x + 4$ $(11x + 2)^2$	i) $2x^3 - x^2 - 50x + 25$ $(x^2 - 25)(2x - 1)$ $(x-5)(x+5)(2x-1)$