Opener/Practice

The expression $9a^2 - 64b^2$ is equivalent to

$(3a+8b)(3a-8b)$

A correct translation of "six less than twice the value of x" is

(1) $2x < 6$

(2) $2x - 6$

(3) $6 < 2x$

(4) $6 - 2x$

Which expression is equivalent to $\frac{2x^6 - 18x^4 + 2x^2}{2x^2}$?

$x^4 - 9x^2 + 1$

Lesson 3c Polynomial Factoring by Grouping Notes

$2a^4 + 22a^2 + 56$

$2(a^4 + 11a^2 + 28)$

$2(a^2 + 7)(a^2 + 4)$

$5m^4 - 4m^2 - 1$

$60m^4 + 65m^2 - 450$

$5(12m^4 + 13m^2 - 90)$

$x^3 - 2x^2 + 25x - 50$

$100x^2 - 36$

Lesson 3c Polynomial Factoring by Grouping Notes

Polynomial Factoring: Factoring by Grouping

	Example:	$30xy + 48x + 25y + 40$
Step 1	Split the polynomial into two groups (front group and back group)	$(30xy + 48x) + (25y + 40)$
Step 2	Find and pull out the GCF of the front group.	$(30xy + 48x)$ $6x(5y + 8)$
Step 3	Find and pull out the GCF of the front group.	$(25y + 40)$ $5(5y + 8)$
Step 4	They should both have a "factor" in common and factors on the "outsides".	
Step 5	Rewrite as two grouped factors – the factors on the outsides in one group, and the common factors as another.	$(5y+8)(6x+5)$

Examples:

1.) $4xy + 2x - 6y - 3$ $2x(2y+1) - 3(2y+1)$ $(2x-3)(2y+1)$	2.) $10m^3 + 25m^2 - 16m - 40$ $5m^2(2m+5) - 8(2m+5)$ $(2m+5)(5m^2-8)$
3.) $21xy + 18x - 56y - 48$	4.) $15xy + 35x - 24y^2 - 56y$

Lesson 3c Polynomial Factoring by Grouping Notes

Lesson 3c Classwork/Homework: Factoring by grouping – FACTOR COMPLETELY

1) $x^2 + 3x + 2x + 6$

2) $x^2 + 5x + 4x + 20$

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

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

3) $2x^3 - x^2 - 10x + 5$

$x^2(2x-1)-5(2x-1)$

$(2x-1)(x^2-5)$

4) $x^3 + 10x^2 + 5x + 50$

5) $15x^3 + 5x^2 + 3x + 1$

$5x^2(3x+1)+1(3x+1)$

$(3x+1)(5x^2+1)$

6) $20n^3 + 12n^2 + 25n + 15$

7) $4n^3 - 12n^2 + 3n - 9$

8) $2m^3 - m^2 + 4m - 2$

$m^2(2m-1)+2(2m-1)$

$(2m-1)(m^2+2)$

9) $15xy + 6x^2 - 5ny - 2nx$

10) $12xy + 20xa - 84ay - 140a^2$

11) $24xy + 64x^2 + 42y + 112x$

12) $84xy + 196x - 36y - 84$

$4x(21y+49)-6(6y+14)$

$28x(3y+7)-12(3y+7)$

$(3y+7)(28x-12)$

$4(3y+7)(7x-3)$

Lesson 3c Polynomial Factoring by Grouping Notes

Factor each completely.

1) $64r^3 - 72r^2 - 24r + 27$

2) $2m^3 - 5m^2 - 12m + 30$

3) $200n^3 - 125n^2 + 360n - 225$

4) $27v^3 + 9v^2 - 24v - 8$

5) $5a^3 + 45a^2 - 6a - 54$

6) $25x^3 + 15x^2 + 10x + 6$

7) $189x^6 + 168x^5 - 252x^4 - 224x^3$

8) $81n^3 + 72n^2 + 135n + 120$

9) $243p^6 - 135p^5 + 54p^4 - 30p^3$

10) $k^3 + 2k^2 - k - 2$

11) $10x^3 + 40x^2 + x + 4$

12) $14n^3 - 49n^2 - 12n + 42$

13) $5m^3 + 6m^2 - 35m - 42$

14) $36r^3 - 42r^2 - 30r + 35$

Lesson 3c Polynomial Factoring by Grouping Notes

Today's Lesson

Factoring by Grouping

$36k^3 + 42k^2 + 42k + 49$

$8a^3 - 3a^2 - 56a + 21$

$16x^3 - 12x^2 + 40x - 30$

$12n^3 - 30n^2 - 20n + 50$

23) $42n^3 - 18n^2 + 49n - 21$

24) $42m^3 - 18m^2 + 70m - 30$

25) $10p^3 + 8p^2 + 25p + 20$

26) $210x^3 - 240x^2 + 35x - 40$

27) $49b^3 + 21b^2 - 35b - 15$

28) $100n^3 + 80n^2 - 25n - 20$