

$x^2 - 4$



$x^2 + 4x + 4$



# Polynomials

## LESSON FOUR - *Special Polynomials*

### Lesson Notes

#### Introduction

Factor each expression using algebra tiles first, then use the shortcut.

 $x^2$  $x$  $1$  $-x^2$  $-x$  $-1$ 

a)  $4x^2 - 9$



#### Difference of Squares Shortcut

b)  $x^2 - 6x + 9$



#### Perfect Square Trinomial Shortcut

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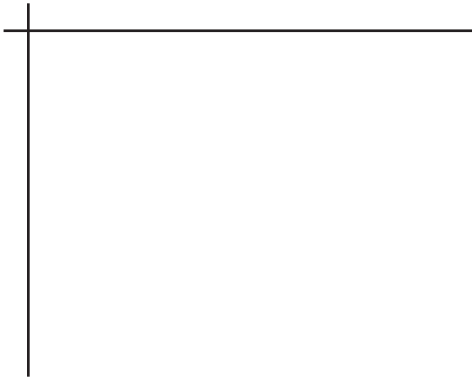
$x^2 + 4x + 4$



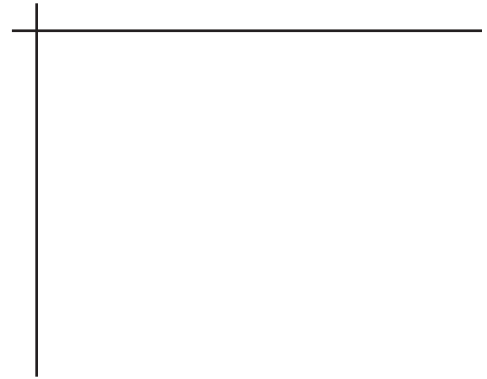
#### Example 1

Factor each expression using algebra tiles.

a)  $9x^2 - 16$



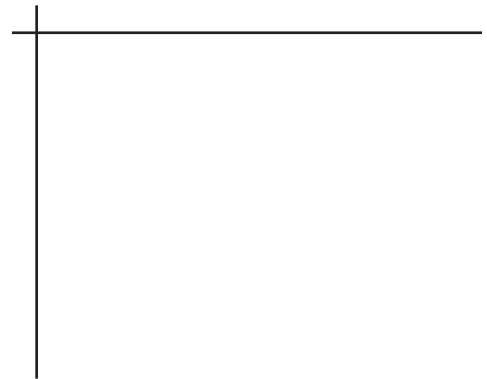
c)  $16x^2 + 24x + 9$



b)  $16 - 9x^2$



d)  $1 - 16x + 64x^2$

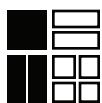


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### Example 2

Factor each expression using decomposition.

*Note: In this example, we are factoring the trinomials from Example 1 algebraically.*

a)  $9x^2 - 16$

$A \times C =$   |  $B =$   | works?


b)  $16 - 9x^2$

$A \times C =$   |  $B =$   | works?


c)  $16x^2 + 24x + 9$

$A \times C =$   |  $B =$   | works?


d)  $1 - 16x + 64x^2$

$A \times C =$   |  $B =$   | works?


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### Example 3

Factor each expression using a shortcut.

*Note: In this example, we are factoring the trinomials from Examples 1 & 2 with a shortcut.*

a)  $9x^2 - 16$

c)  $16x^2 + 24x + 9$

b)  $16 - 9x^2$

d)  $1 - 16x + 64x^2$

### Example 4

If possible, factor each of the following

a)  $x^2 + 9$

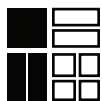
b)  $x^2 - 8x + 4$

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$x^2 + 4x + 4$



#### Example 5

If possible, factor each of the following

a)  $9x - 4x^3$

d)  $16x^2 + 8xy + y^2$

b)  $4x^2 + 16$

e)  $9x^4 - 24x^2 + 16$

c)  $2x^4 - 32$

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$x^2 - 4$



$x^2 + 4x + 4$



#### Example 6

Find a value for  $k$  that will make each expression a perfect square trinomial.

a)  $9x^2 + kx + 49$

b)  $25x^2 + 10x + k$

c)  $kx^2y^2 - 48xy + 9$