5.3 Special Products

In the previous section we discussed how to multiply polynomials and it ended with examples of the FOIL method for multiplying. This section provides shortcut methods for multiplying polynomials that are given in specific forms. Anything given in this section can be found using the FOIL method, but knowing these shortcuts can make some of what we do in chapter 6 - factoring.

Definition 5.3.1 (Difference of Squares)
$a^2 - b^2 = (a - b)(a + b)$

Definition 5.3.2 (Square of a Binomial Sum)
$(a + b)^2 = a^2 + 2ab + b^2$

Definition 5.3.3 (Difference of a Binomial Sum)
$(a - b)^2 = a^2 - 2ab + b^2$

Example 5.3.1
Find the following using a special product formula.

$$(7y + 8)(7y - 8)$$

Example 5.3.2
Find the following using a special product formula.

$$(2a^3 + 3)(2a^3 - 3)$$

Example 5.3.3
Find the following using a special product formula.

$$(x + 10)^2$$

Example 5.3.4
Find the following using a special product formula.

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

Example 5.3.5
Find the following using a special product formula.

$$(x - 9)^2$$

Example 5.3.6
Find the following using a special product formula.

$$(7x - 3)^2$$