

# 2.4 Use the Binomial Theorem

**Goal** • Use the Binomial Theorem to expand binomials.

p. 72

Georgia  
Performance  
Standard(s)

MM1A2d



$$4. (a+3)^3$$

*Third*: 1 3 3 1

$$1a^3 + 3a^2(3) + 3a(3)^2 + (3)^3$$

$$a^3 + 9a^2 + 3a(9) + 27$$

$$a^3 + 9a^2 + 27a + 27$$



$$10. (c-2)^4 \\ = [c + (-2)]^4$$

*Fourth: 1 4 6 4 1*

$$1c^4 + 4c^3(-2) + 6c^2(-2)^2 + 4c(-2)^3 + (-2)^4$$

$$c^4 - 8c^3 + 6c^2(4) + 4c(-8) + 32$$

$$c^4 - 8c^3 + 24c^2 - 32c + 32$$



$$16.(3x-1)^4$$

$$[3x+(-1)]^4$$

*Fourth: 1 4 6 4 1*

$$1(3x)^4 + 4(3x)^3(-1)^1 + 6(3x)^2(-1)^2 + 4(3x)^1(-1)^3 + 1(-1)^4$$

$$81x^4 - 4(27)x^3(-1) + 6(9)x^2(1) + 4(3)x(-1) + 1$$

$$81x^4 - 108x^3 + 54x^2 - 12x + 1$$



$$20.(6x + y)^4$$

*Fourth: 1 4 6 4 1*

$$1(6x)^4 + 4(6x)^3(y) + 6(6x)^2(y)^2 + 4(6x)(y)^3 + (y)^4$$

$$1296x^4 + 4(216x^3)(y) + 6(36x^2)y^2 + 24xy^3 + y^4$$

$$1296x^4 + 864x^3y + 216x^2y^2 + 24xy^3 + y^4$$

