### Notes A1 - Multiplying Polynomials

1. \((2a^2 + 7)^2\)
   
   
   
   \[ (2a^2 + 7)^2 \]
   
   \[ (2a^2 + 7)(2a^2 + 7) \]
   
   \[ 4a^4 + 14a^2 + 49 \]
   
   \[ 4a^4 + 28a^2 + 49 \]
   
   **Cubes**
   
   \[(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3\]

2. \((x + 2y)^3\)

   \[ (x + 2y)^3 \]
   
   \[ x^3 + 3x^2(2y) + 3x(2y)^2 + (2y)^3 \]
   
   \[ x^3 + 6x^2y + 12xy^2 + 8y^3 \]

   \[(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3\]

3. \((2y - 5)^2\)

   \[ (2y - 5)^2 \]
   
   \[ (2y)^2 - 3(2y)(5) + 3(2y)(5)^2 - 5^2 \]
   
   \[ 4y^2 - 60y + 150y - 125 \]

4. \((x^3 - y)^2\)

   \[ (x^3 - y)(x^3 - y) \]
   
   \[ x^6 - x^3y - x^3y + y^2 \]
   
   \[ x^6 - 2x^3y + y^2 \]

   **TRY:**

   1. \((f + 2g)^3\)

   \[ f^3 + 6f^2g + 12fg^2 + 8g^3 \]

   \[ 6a^2 + 2x^3 + y^2 + y^2 \]

   2. \((x^{3n} - y^n)^2\)

   \[ (x^{3n} - y^n)(x^{3n} - y^n) \]
   
   \[ x^{6n} - 2x^{3n}y + y^{2n} \]

5. \(r^2(r+1)(r-1)\)

   \[ r^2(r^2-1) \]
   
   \[ r^2 - r^2 \]

6. \((3x+y+1)(3x-y-1)\)

   \[ 3x + (y+1) \]
   
   \[ 3x - (y+1) \]

   \[ (3x)^2 - (y+1)^2 \]
   
   \[ 9x^2 - (y^2 + 2y + 1) \]

   \[ 9x^2 - y^2 - 2y - 1 \]