Multiplying a Binomial by Two Trinomials (I)

Simplify each expression.

1. $(y^4 + y^3)(-9y^4 + 8y^3 - y^2)(3y^2 - 2y + 4)$

2. $(8f^2 + 4f)(f^2 + 7f + 6)(-4f^3 - 9f^2 - 6f)$

3. $(2z - 6)(2z^5 - 4z^4 + 8z^3)(-2z^3 + 5z^2 - 8z)$

4. $(-v + 3)(7v^2 + 4v + 4)(5v^2 - 6v + 9)$

5. $(-5q^4 + 2q^3)(4q^4 + 3q^3 + 2q^2)(9q^2 - 2q - 3)$

Simplify each expression.

1. $(y^4 + y^3)(-9y^4 + 8y^3 - y^2)(3y^2 - 2y + 4)$
   $= -27y^{10} + 15y^9 - 13y^8 - 21y^7 + 30y^6 - 4y^5$

2. $(8f^2 + 4f)(f^2 + 7f + 6)(-4f^3 - 9f^2 - 6f)$
   $= -32f^7 - 312f^6 - 892f^5 - 1140f^4 - 672f^3 - 144f^2$

3. $(2z - 6)(2z^5 - 4z^4 + 8z^3)(-2z^3 + 5z^2 - 8z)$
   $= -8z^9 + 60z^8 - 212z^7 + 456z^6 - 560z^5 + 384z^4$

4. $(-v + 3)(7v^2 + 4v + 4)(5v^2 - 6v + 9)$
   $= -35v^5 + 127v^4 - 125v^3 + 165v^2 + 108$

5. $(-5q^4 + 2q^3)(4q^4 + 3q^3 + 2q^2)(9q^2 - 2q - 3)$
   $= -180q^{10} - 23q^9 + 38q^8 + 65q^7 + 4q^6 - 12q^5$