

For each of the following polynomials, factor as much as possible over \mathbb{Q} .

1. $X^3 + 4X^2 + X - 1$.

2. $X^5 + 9X^4 + 12X^2 + 6$.

3. $X^4 + 4X^3 + 6X^2 + 2X + 1$.

4. $2X^4 - 5X^3 + 3X^2 + 4X - 6$.

5. $21X^3 - 3X^2 + 2X + 9$.

6. $7X^3 + 6X^2 + 4X + 6$.

7. $5X^{11} - 6X^4 + 12X^3 + 36X - 6$.