7.5

General Aproach to factoring

1. Factor out GCF!
2. If there are 2 terms
   - Is it the difference of two squares?
     $$A^2 - B^2 = (A+B)(A-B)$$
   - Is it the sum of two cubes?
     $$A^3 + B^3 = (A+B)(A^2 - AB + B^2)$$
   - Is it the difference of two cubes?
     $$A^3 - B^3 = (A-B)(A^2 + AB + B^2)$$
3. If there are 3 terms, factor normally
4. If there are 4 (or more) terms, factor by grouping.
5. Can any of these factors be factored?
   - If yes, go to #1
6. Check.

Ex factor $16x^6 - 4x^4$

1. $4x^4(4x^2 - 1)$
2. diff. of 2 squares
   $$4x^4((2x)^2 - (1)^2) = 4x^4(2x+1)(2x-1)$$

3,4,5 → no

6. $4x^4(2x+1)(2x-1) = 4x^4(4x^2 - 2x + 2x - 1)$
   $= 4x^4(4x^2 - 1) = 16x^6 - 4x^4$ ✓

Try some: factor #1. $x^3 + 3x^2 - 25x - 75$ #2. $4x^3 - 100x$
#3. $2x^5 + 128x^2$ #4. $35x^2 - 2x - 1$ #5. $6x^3 + 24x$