Summary of Factoring
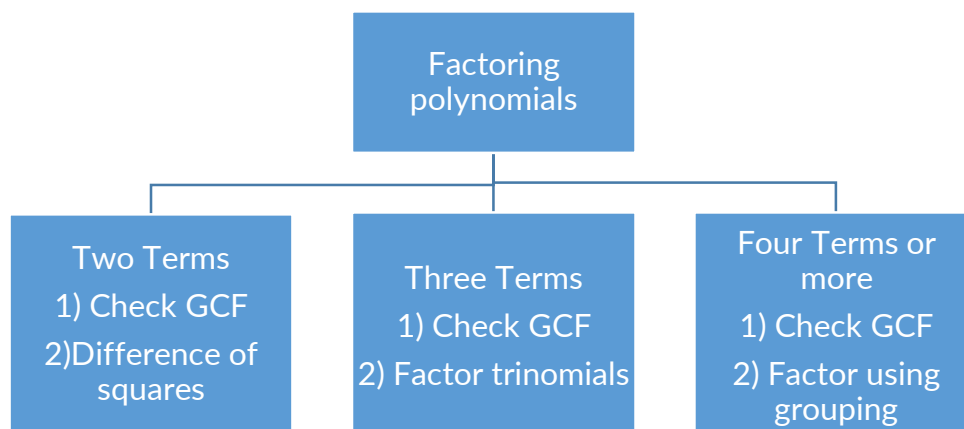
You have used many methods to factor polynomials. The following chart can help you decide which method to use.

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                    ┌──────────────────────┐
                    │     Factoring        │
                    │    polynomials       │
                    └──────────────────────┘
        ┌───────────────────┼───────────────────────┐
┌─────────────────┐ ┌─────────────────┐ ┌─────────────────────┐
│   Two Terms     │ │  Three Terms    │ │  Four Terms or      │
│  1) Check GCF   │ │ 1) Check GCF    │ │  more               │
│  2)Difference of│ │ 2) Factor       │ │  1) Check GCF       │
│  squares        │ │ trinomials      │ │  2) Factor using    │
│                 │ │                 │ │  grouping           │
└─────────────────┘ └─────────────────┘ └─────────────────────┘
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Recall that a polynomial is factored completely when it is written as a product of prime factors which means cannot be factored further.

Example 1: Tell whether each polynomial is completely factored. If not, factor it.

1) $\quad 2x\left(x^2+4\right)$

2) $2x\left(x^2-4\right)$

3) $\left(2x+6\right)\left(x+10\right)$

Solution

1) $2x\left(x^2+4\right)$ is factored completely .

2) $2x\left(x^2-4\right)\qquad x^2-4$ can be factored using difference of 2 squares.

$\quad = 2x\left(x-2\right)\left(x+2\right)$

3) $\left(2x+6\right)\left(x+10\right)\qquad$ 2x+6 can be factored by factoring GCF.

$\quad = 2\left(x+3\right)\left(x+10\right)$