## Lesson Plan

Grade 10 Academic Math
Unit: Polynomials

Lesson: 5
Topic: $\underline{\text { Factoring } x^{2}+b x+c}$

## \# homework check: $\underline{\text { Principles of Mathematics } 10 \text { p. 203 \# 7, 9-11 and FM } 10 \text { p. } 68 \text { \# }}$

 1-3
## \# note: Factoring $\mathrm{x}^{2}+\mathrm{bx}+\mathrm{c}$

Factoring is the opposite operation of expanding (and simplifying). Since the last step in expanding binomials is the collection of like terms, to factor we must separate (decompose) that middle term.

When decomposing, we look for the number that multiplies to give us AC and adds to give us B in the trinomial $A x^{2}+B x+C$. For example,
a) $x^{2}+3 x-18=\quad A C=1(-18)=-18 \quad B=3$ $=(x+6)(x-3)$
b) $x^{2}-5 x-14=\quad A C=1(-14)=-14 \quad B=-5$
$=(x-7)(x+2)$
c) $x^{2}+2 x y-35 y^{2}=\quad A C=1(-35)=-35 \quad B=2$
$=(x+7 y)(x-5 y)$
Sometimes it is possible to common factor the value of A from the entire trinomial before decomposing the quadratic. For example,
d) $3 \mathrm{x}^{2}+12 x-36=$
$=3\left(x^{2}+4 x-12\right)$
product $=-12 \quad$ sum $=4$
$=3(x+6)(x-2)$
e) $-2 x^{2}-6 x y+108 y^{2}=$
$=-2\left(x^{2}+3 x y-54 y^{2}\right)$
product $=-54 \quad$ sum $=3$
$=-2(x+9 y)(x-6 y)$

$$
\begin{aligned}
& \text { f) } 7 x^{2}-28= \\
& =7\left(x^{2}-4\right) \\
& \text { product }=-4 \quad \text { sum }=0 \\
& =7(x+2)(x-2)
\end{aligned}
$$

\# homework assignment: Principles of Mathematics 10 p. 211 \# 3, 6 - 9, 12, 16, 19, 20

