

$ax^2 + bx + c$ Split the middle term ($a \neq 1$)

$$3x^2 - 2x - 5$$

$3 \cdot (-5) = -15$

$-5 \cdot 3$
 $-3 \cdot 5$
 $-15 \cdot 1$
 $-1 \cdot 15$

$$(3x^2 - 5x) + (3x - 5)$$
$$x(3x - 5) + 1(3x - 5)$$
$$(x + 1)(3x - 5)$$

Steps

- 1) Multiple $a \cdot c$
- 2) Find factors of $a \cdot c$ that add up to "b" term
- 3) Use values from Step #2 to replace "b" term (a and c do not change)
- 4) Use Parenthesis to group 1st 2 terms together and 2nd 2 terms together
- 5) For each set of parenthesis Find GCF
- 6) GCF go in 1 set of parenthesis whatever is in parenthesis carries down

$$4n^2 - 15n - 25$$

$$(4n^2 - 20n) + (5n - 25)$$
$$4n(\underline{n-5}) + 5(\underline{n-5})$$

$$(4n+5)(n-5)$$

$$4 \cdot (-25) = \underline{-100}$$

$$-50 \cdot 2$$

$$-2 \cdot 50$$

$$-25 \cdot 4$$

$$-4 \cdot 25$$

$$-100 \cdot 1$$

$$-1 \cdot 100$$

$$\underline{-20 \cdot 5}$$

$$\begin{aligned}
 &5x^2 - 18x + 9 \\
 &(5x^2 - 15x) - 3(x - 3) \\
 &\underline{5x(x-3)} - \underline{3(x-3)} \\
 &(x-3)(5x-3)
 \end{aligned}$$

$$\begin{aligned}
 \text{S.F.} &= \frac{45}{\textcircled{-15 \cdot -3}}
 \end{aligned}$$

$$\begin{aligned}
 &- (3x + 9) \\
 &\underline{-3(x+3)}
 \end{aligned}$$

$$3n^2 - 8n + 4$$

$$(3n^2 - 6n)(-2n + 4)$$

$$3n(\underline{n-2}) - 2(\underline{n-2})$$

$$(3n-2)(n-2)$$

$$3n^2 - 6n - 2n + 4$$

$$3 \cdot 4 = \frac{12}{-6 \cdot -2}$$

$$x^2 - 12x + 27$$

$$1 \cdot 27 = 27$$

$$\textcircled{-9, -3}$$

$$(x^2 - 9x)(-3x + 27)$$

$$x(x-9) - 3(x-9)$$

$$(x-3)(x-9) \leftarrow$$

$$4x^2 - 9$$
$$(4x^2 - 6x) + (6x - 9)$$
$$2x(2x - 3) + 3(2x - 3)$$
$$(2x + 3)(2x - 3)$$

$$4 \cdot -9 = \frac{-36}{-6 \cdot 6}$$