Name: _____ Date: _____

Learning Goal 1.2	Factor trinomials of the form $ax^2 + bx + c$.

Example Factor the following expression. Expand your answer to check your work.

a. $s^2 + 11s + 30$
$= s^2 + 6s + 5s + 30$
$= s(s + 6) + 5(s + 6)$
$= (s + 6)(s + 5)$

or

$6 \times 5 = 30$
$6 + 5 = 11$
$s^2 + 11s + 30 = (s + 6)(s + 5)$

a. $20 - 9b + b^2$
$= 20 - 5b - 4b + b^2$
$= 5(4 - b) - b(4 - b)$
$= (4 - b)(5 - b)$

or

$-4 \times -5 = 20$
$(-4) + (-5) = -9$
$b^2 - 9b + 20 = (b - 4)(b - 5)$

b. $n^2 - n - 30$
$= n^2 - 6n + 5n - 30$
$= n(n - 6) + 5(n - 6)$
$= (n - 6)(n + 5)$

or

$(-6) \times 5 = -30$
$(-6) + 5 = -1$
$n^2 - n - 30 = (n - 6)(n + 5)$

c. $-4t^2 - 16t + 128$
$= -4(t^2 + 4t - 32)$
$= -4(t^2 + 8t - 4t - 32)$
$= -4\big(t(t + 8) - 4(t + 8)\big)$
$= -4(t + 8)(t - 4)$

or

$8 \times (-4) = -32$
$8 + (-4) = 4$
$-4(t^2 + 4t - 32)$
$= -4(t + 8)(t - 4)$

d. $-24 - 5d + d^2$
$= d^2 - 5d - 24$
$= d^2 - 8d + 3d - 24$
$= d(d - 8) + 3(d - 8)$
$= (d - 8)(d + 3)$

or

$(-8) \times 3 = -24$
$(-8) + 3 = -5$
$d^2 - 5d - 24 = (d - 8)(d + 3)$

e. $-30 + 7m + m^2$
$= m^2 + 7m - 30$
$= m + 10m - 3m - 30$
$= m(m + 10) - 3(m + 10)$
$= (m + 10)(m - 3)$

or

$(-3) \times 10 = -30$
$(-3) + 10 = 7$
$m^2 + 7m - 30 = (m - 3)(m + 10)$