Unit 3.3: Factoring Quadratics when the Leading Coefficient is not 1

1) Factor each expression completely.

a. $x^2 + 8x - 9$ $\quad -9x^2$

$(x+9)(x-1)$ $\quad +9\ -1$

We use the shortcut since there is no coefficient in front of x^2

b. $2n^2 + 2n - 84$ $\quad -42n^2$

$2(n^2+n-42)$ $\quad -6\ 7$

$2(n-6)(n+7)$

Can use shortcut after factoring out GCF

c. $5x^2 - 6x + 9$

d. $x^3 + 2x^2 - 8x$

$x(x^2+2x-8)$ $\quad -8x^2$

$4\ -2$

$x(x+4)(x-2)$

2) Factor each expression completely.

Write down the steps for factoring by grouping in your own words:

a. $2n^2 - 7n - 4$ $\quad -8n^2$

$2n^2 - 8n + 1n - 4$ $\quad -8n\ 1n$

$2n(n-4) + 1(n-4)$

$(n-4)(2n+1)$

b. $3x^2 + 11x - 4$ $\quad -12x^2$

$3x^2 + 12x - 1x - 4$ $\quad 12x\ -1x$

$3x(x+4) - 1(x+4)$

$(x+4)(3x-1)$

c. $5a^2 - 13a - 6$ $\quad -30a^2$

$5a^2 - 15a + 2a - 6$ $\quad -15a\ 2a$

$5a(a-3) + 2(a-3)$

$(a-3)(5a+2)$

d. $8x^2 + 2x - 1$

e. $10x^2 + 7x - 12$

f. $28m^2 - m - 2$

3) Fill in the blank with the answer that makes the two expressions equivalent.

a. $x^2 + 3x - 40 = (x+8)(x-5)$

Distribute to check

$x^2 - 5x$

$+8x - 40$

$x^2 + 3x - 40$

b. $x^2 - \_\_\_\_ - 30 = (x-10)(x+3)$