3.3 Factoring Quadratic Trinomials part 2

1) Factor each expression completely.

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

$x^2 + 9x - 1x - 9$
$x(x+9) - 1(x+9)$
$9x$ $(-1x)$
$(x-1)(x+9)$

b. $n^2 - 7n + 6$ $6n^2$

$n^2 - 1n - 6n + 6$
$n(n-1) - 6(n-1)$ $(-1n)$ $(-6n)$
$(n-6)(n-1)$

c. $m^2 - m - 56$ $-56m^2$

$m^2 - 8m + 7m - 56$
$m(m-8) + 7(m-8)$ $(-8m)$ $(7m)$
$(m+7)(m-8)$

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

Look back on all of the examples that you did. Look for any patterns that happen in the process. Write down anything you notice.

The two numbers that we picked for the glasses are the numbers in the factors

Turns out that sometimes we can use a shortcut to factor. We can use the shortcut when ___$a = 1$___ (after we factor out the GCF).

1) Factor each expression.

a. $x^2 + 7x + 10$ $10x^2$
$(x+5)(x+2)$ $5x$ $2x$

b. $x^2 + 4x - 32$ $-32x^2$
$(x+8)(x-4)$ 8 -4

Now that we've had practice when a=1, let's combine this with a greatest common factor. Remember, you can still use the shortcut if ___$a = 1$ after factoring out the GCF___.

2) Factor each expression.

a. $2v^2 + 18v + 40$
$2(v^2 + 9v + 20)$ $20v^2$
$2(v+5)(v+4)$ $5v$ $4v$

b. $3x^2 - 12x - 36$
$3(x^2 - 4x - 12)$ $-12x^2$
$3(x-6)(x+2)$ $-6x$ $2x$

c. $-x^2 - 5x + 36$
$-(x^2 + 5x - 36)$ $-36x^2$
$-(x+9)(x-4)$ $9x$ $-4x$

d. $-4y^2 - 20y + 56$
$-4(y^2 + 5y - 14)$ $-14y^2$
$-4(y+7)(y-2)$ $7y$ $-2y$

e. $3a^3 - 6a^2 + 240a$

$50a^2$

$3a(a^2 - 2a + 80)$

$\wedge$

- Doesn't factor

f. $2x^2 + 16x - 66$

$-33x^2$

$2(x^2 + 8x - 33)$

$11x \overset{\wedge}{} -3x$

$2(x+11)(x-3)$

3) A square has an area of $x^2 + 10x + 25$. Write an expression in terms of x for the possible length and width of the square.

$25x^2$

$\wedge$

$5x \quad 5x$

$(x+5)(x+5)$

Length: $(x+5)$

Width: $(x+5)$

4) The Johnsons are putting a fence in their backyard, but are very picky about the ratio of the fence dimensions. They want to make sure that the area of the lawn is always represented by $x^2 - 9x + 20$. What expressions could represent the dimensions of their fence?

$20x^2$

$\wedge$

$-4x \quad -5x$

$(x-4)(x-5)$