Solutions from last class

Check your answers while MacKenzie checks HW

4.1 Factor using the area model. State your answer.

1. $\boxed{x^2} + 8x \boxed{+ 7}$

	x	$+7$
x	x^2	$+7x$
$+1$	$+1x$	$+7$

$= 8x$

$= \underline{(x+7)(x+1)}$

2. $\boxed{x^2} + 11x \boxed{+ 18}$

	x	$+9$
x	x^2	$+9x$
$+2$	$+2x$	$+18$

$= +11x$

$= \underline{(x+9)(x+2)}$

3. $\boxed{x^2} - 7x \boxed{+ 12}$

	x	-3
x	x^2	$-3x$
-4	$-4x$	$+12$

$= -7x$

$= \underline{(x-3)(x-4)}$

4. $\boxed{x^2} + 14x \boxed{+ 45}$

	x	$+9$
x	x^2	$+9x$
$+5$	$+5x$	$+45$

$= 14x$

$= \underline{(x+9)(x+5)}$

5. $\boxed{x^2} - 2x \boxed{- 15}$

	x	-5
x	x^2	$-5x$
$+3$	$+3x$	-15

$= -2x$

$= \underline{(x-5)(x+3)}$

6. $\boxed{x^2} - 8x \boxed{+ 16}$

	x	-4
x	x^2	$-4x$
-4	$-4x$	$+16$

$= -8x$

$= \underline{(x-4)(x-4)}$ or $(x-4)^2$

7. $\boxed{x^2} + 4x \boxed{- 21}$

	x	$+7$
x	x^2	$+7x$
-3	$-3x$	-21

$= 4x$

$= \underline{(x+7)(x-3)}$

8. $\boxed{x^2} - 3x \boxed{- 18}$

	x	-6
x	x^2	$-6x$
$+3$	$+3x$	-18

$= -3x$

$= \underline{(x-6)(x+3)}$

Factoring Trinomials

Last class we learned to factor using an area model.

$\boxed{x^2} + 3x \boxed{- 10} = (x+5)(x-3)$

	x	$+5$
x	x^2	$+5x$
-2	$-2x$	-10

$= +3x$ ✓

① Put the first and last term in the area model

② Write values on the outside that work

* ③ Check that your middle term works
↳ change outside #s if needed

④ Write the factored form

Let's factor the following together as a warmup:

$x^2 + 8x - 9$

$x^2 - 13x + 22$

Factoring Trinomials

Last class we learned to factor using an area model.

$\boxed{x^2} + 3x \boxed{-10} = (x+5)(x-3)$

	x	$+5$
x	x^2	$+5x$
-2	$-2x$	-10

$= +3x$

① Put the first and last term in the area model

② Write values on the outside that work

* ③ Check that your middle term works
↳ change outside #s if needed

④ Write the factored form

Let's factor the following together as a warmup:

$\boxed{x^2} + 8x \boxed{-9} = (x+9)(x-1)$

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

$= +8x$

$\boxed{x^2} - 13x \boxed{+22} = (x-11)(x-2)$

	x	-11
x	x^2	$-11x$
-2	$-2x$	$+22$

$= -13x$

or

$(x-2)(x-11)$

On a piece of paper, with your neighbour

Factor using an area model:

$x^2 + 8x + 12$

$x^2 + 5x - 36$

$x^2 - 5x - 14$

$x^2 - 10x + 16$

Solutions

Factor using an area model:

$x^2 + 8x + 12 = (x+6)(x+2)$

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

$x^2 - 5x - 14 = (x-7)(x+2)$

$x^2 - 10x + 16 = (x-2)(x-8)$

Nov 8-9:11 AM

Recall form last unit

What does each form tell you about the parabola?

pull down to reveal

Factored Form

$y=-2(x-3)(x+4)$

zeros: 3 and -4

Vertex Form

$y=3(x-4)^2+6$

vertex: $(+4, +6)$

Standard Form

$y=4x^2+7x-10$

y-intercept = -10

What do we know about this quadratic?

$$y = x^2 - 6x - 16$$

What would be the benefit of factoring this equation?

What do we know about this quadratic?

$$y = x^2 - 6x - 16$$

$$y = x^2 - 6x - 16$$

y-intercept = -16

What would be the benefit of factoring this equation?

We will also be able to identify the **zeroes**

Factoring to Find Zeros

handout

We know the y-intercept from an equation in standard form.

$y = x^2 - 6x - 16$ the y-intercept is ______

If we rearrange the equation to factored form we can find the zeros.

To do this we need to factor using our area model.

$y = x^2 - 6x - 16$

the zeros are ____ and ____

* remember the zeros change signs when we pull them out of the brackets

Factor the following. Then state the y-intercept and zeros.

$y = x^2 + 10x + 21$

the y-intercept is ______

the zeros are ____ and ____.

Try the next one with your partner

$y = x^2 - 11x + 24$

the y-intercept is ______

the zeros are ____ and ____.

Factoring to Find Zeros

We know the y-intercept from an equation in standard form.

$y = x^2 - 6x - 16$ the y-intercept is -16

If we rearrange the equation to factored form we can find the zeros.

To do this we need to factor using our area model.

$y = x^2 - 6x - 16$

$y = (x-8)(x+2)$

	x	-8
x	x^2	$-8x$
$+2$	$+2x$	-16

$= -6x$

the zeros are $+8$ and -2

* remember the zeros change signs when we pull them out of the brackets

Factor the following. Then state the y-intercept and zeros.

$y = x^2 + 10x + 21$

$y = (x+7)(x+3)$

	x	$+7$
x	x^2	$+7x$
$+3$	$+3x$	$+21$

$= +10x$

the y-intercept is $+21$

the zeros are -7 and -3.

$y = x^2 - 11x + 24$

$y = (x-8)(x-3)$

	x	-8
x	x^2	$-8x$
-3	$-3x$	$+24$

$= -11x$

the y-intercept is $+24$

the zeros are $+8$ and $+3$.

Individual Practice - Back of the sheet (finish in class or for homework)

1. For each relation, find the y-intercept, then factor to find x-intercepts

a) Standard Form: $y = x^2 + 7x + 10$

Y-int = ______

Factor:

Factored form:

____

x-int's: ____________

Standard form: $y = x^2 + 4x - 21$

Y-int = ______

Factor:

Factored form:

____

x-int's: ____________

b) Standard form: $y = x^2 – 8x + 12$

Y-int = ______

Factor:

Factored form:

____

x-int's: ____________

2. For each relation, factor to find the x-intercepts (zeroes).

a) $y = x^2 + 6x + 5$

zeroes: __________

c) $y = x^2 - 12x + 20$

zeroes: __________

e) $y = x^2 - 4x -21$

zeroes: __________

b) $y = x^2 – 5x – 36$

zeroes: __________

d) $y = x^2 – 9x + 20$

zeroes: __________

f) $y = x^2 – 6x – 27$

zeroes: __________

Nov 12-10:08 AM

Individual practice

handout

1. For each relation, find the y-intercept, then factor to find x-intercepts

a) Standard Form:

$y = x^2 + 7x + 10$

Y-int = 10

Factor:

	x	$+5$
x	x^2	$5x$
$+2$	$2x$	10

$\to 7x$

Factored form:

$y=(x+5)(x+2)$

x-int's: -5 and -2

Standard form:

$y = x^2 + 4x - 21$

Y-int = -21

Factor:

	x	$+7$
x	x^2	$7x$
-3	$-3x$	-21

$\to 4x$

Factored form:

$y=(x+7)(x-3)$

x-int's: -7 and $+3$

b) Standard form:

$y = x^2 - 8x + 12$

Y-int = 12

Factor:

	x	-6
x	x^2	$-6x$
-2	$-2x$	12

$-8x$

Factored form:

$y=(x-6)(x-2)$

x-int's: $+6$ and $+2$

Individual practice

handout

2. For each relation, factor to find the x-intercepts (zeroes).

a) $y = x^2 + 6x + 5$

	x	$+1$
x	x^2	$1x$
$+5$	$5x$	5

$6x$

$(x+1)(x+5)$

zeroes: -1 and -5

c) $y = x^2 - 12x + 20$

	x	-10
x	x^2	$-10x$
-2	$-2x$	20

$-12x$

$y=(x-10)(x-2)$

zeroes: 10 and 2

e) $y = x^2 - 4x - 21$

	x	-7
x	x^2	$-7x$
$+3$	$+3x$	-21

$-4x$

$y=(x-7)(x+3)$

zeroes: 7 and -3

b) $y = x^2 - 5x - 36$

	x	-9
x	x^2	$-9x$
$+4$	$+4x$	-36

$-5x$

$y=(x-9)(x+4)$

zeroes: 9 and -4

d) $y = x^2 - 9x + 20$

	x	-5
x	x^2	$-5x$
-4	$-4x$	20

$-9x$

$y=(x-5)(x-4)$

zeroes: 5 and 4

f) $y = x^2 - 6x - 27$

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

$-6x$

$y=(x-9)(x+3)$

zeroes: 9 and -3

Let's start our Pink Sheets for unit 4

MacKenzie to handout duotangs

Unit 4 - Quadratics and Factoring

Factoring:

$x^2 + 3x - 10$

x^2	
	-10

1. Put the first and last term in the window
2. Write values on the outside that work

* 3. Check that your middle term works
↳ change outside #s if needed

4. Write the factored form

Add your own factoring question with

- a **negative middle term** and **positive third term**

Unit 4 - Quadratics and Factoring

Factoring:

$\boxed{x^2} + 3x \boxed{- 10} = (x+5)(x-3)$

	x	$+5$
x	x^2	$+5x$
-2	$-2x$	-10

$=+3x$

1. Put the first and last term in the window
2. Write values on the outside that work
3. ✱ Check that your middle term works
   ↳ change outside #s if needed
4. Write the factored form

Add your own factoring question with

- a **negative middle term** and **positive third term**

Hand back Evidence Records (and leftover tests if you were absent Monday)

Nov 11-8:45 PM