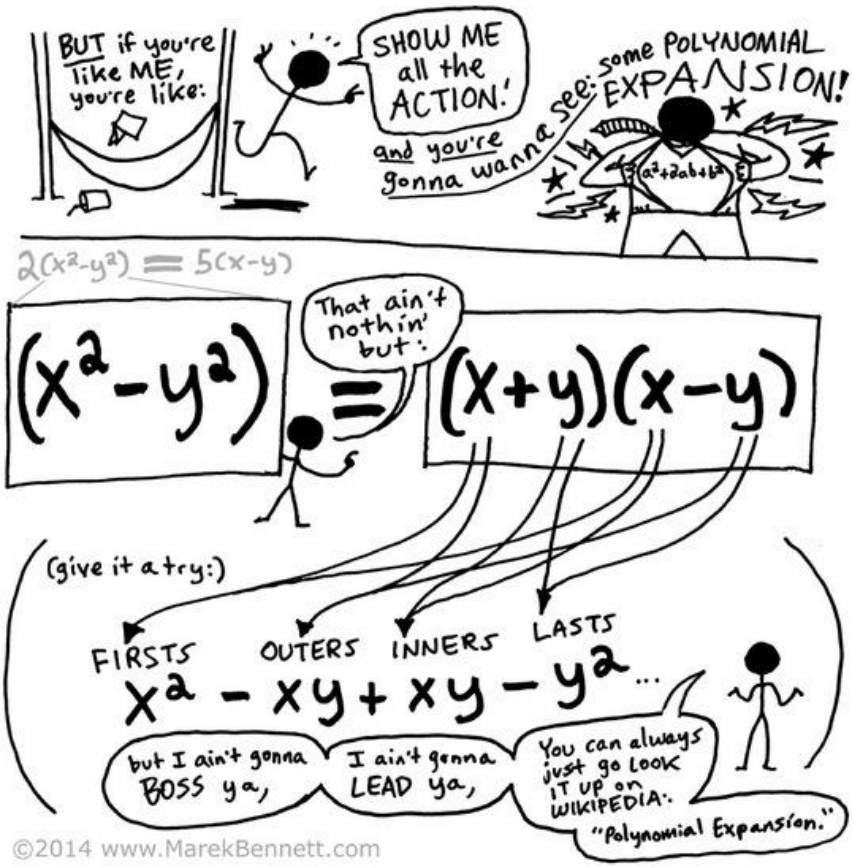
Unit 2.

Quadratic Functions & Factoring



SEPTEMBER				
			1 A Adv	2 H
5 H	6 B	7 A Adv	8 B	9 A 1/2
12 B	13 A Adv/Flex	14 B	15 A 4/5	16 B
19 A Adv/Flex	20 B	21 A 6/7	22 B	23 A 8/1
26 O TW	27 B	28 A Adv/Flex	29 B	30 A 2/4

OCTOBER				
3 B	4 /O A Adv/Flex	5 O H	6 B	7 A 5/6
10 SD	11 B	12 A PSAT	13 B	14 A Adv
17 B	18 A Adv/Flex	19 B	20 A 7/8	21 B
24 O H	25 A Adv/Flex	26 B	27 A 1/2	ER 28 QE B
31 TW				

	Date	Topic	Homework
1	9/15-16	Factoring Binomial Quadratic Expressions (Greatest Common Factor, Difference of Squares)	Page 6
2	9/19-20	Period 5-Review Factoring Binomial	Page 10
3	9/21-9/22	Factoring Quadratic Expressions (a=1)	Page 16
4	9/23-9/27	Factoring Quadratic Expressions (a>1) by grouping	
5	9/28-9/29	Solving Quadratics by factoring	
6	9/30-10/3	***Quiz*** Graph Quadratics	
7	10/4-10/6	Simplifying Radicals & Complex Numbers	
8	10/7-10/11	Quadratic Formula	
9	10/13-10/14	***Review*** **[Unit 1 Test Corrections DUE]**	
10	10/17-10/18	***Test***	

Warm-up $x + x = 2x$ $x \cdot x = x^2$

1. DISTRIBUTE method:

$$a(b+c)=ab+ac$$

Simplify. (Distribute)

1. $2(x + 3) =$ **2x+6**
2. $3(x - 5) =$ **3x-15**
3. $-x(x + 7) =$ **$-x^2-7x$**
4. $-3(x - 5) =$ **-3x+15**
5. $-3x(x - 10) =$ **$-3x^2+30x$**

2. Factoring GCF method:

$$ab+ac=a(b+c)$$

Now, go back to your answers for #1-5 and factor. Check your answers.

1. **2x+6=2(x+3)**
2. **3x-15=3(x-5)**
3. **$-x^2-7x= -x(x+7)$**
4. **-3x+15= 3(-x+5)**
5. **$-3x^2+30x=3x(-x+10)$**

3. FOIL Method :

$$(a+b)(c+d)=ac+ad+bc+bd$$

	a	+b
c	ac	bc
+d	ad	bd

Example Simplify $(x-7)(x-2)=x^2-9x+14$

	x	-7
x	x^2	$-7x$
-2	$-2x$	$+14$

Practice

1. $(x+4)(x-3)= x^2+x-12$

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

2. $(3x+1)(x+5)= 3x^2+16x+5$

	3x	+1
x	$3x^2$	$+x$
+5	$+15x$	$+5$

3. $(2x+5)(3x-7)= 6x^2+x-35$

	2x	+5
3x	$6x^2$	$+15x$
-7	$-14x$	-35

4. $3(4x-1)(x-5)= (12x-3)(x-5)=12x^2-63x+15$

	12x	-3
x	$12x^2$	$-3x$
-5	$-60x$	$+15$

4. Difference of squares (DOS) :

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

Same binomial except addition/subtraction signs

Example Factor.

$16-x^2$ *$= (4+x)(4-x)$*

$64-100x^2$ *$=(8+10x)(8-10x)$*

x^2-25 *$=(x+5)(x-5)$*

Practice Factor.

1. $a^2 - 36 = (a+6)(a-6)$	2. $x^2 - 49$ **(x+7)(x-7)**
3. $x^2 - 1$ **(x+1)(x-1)**	4. $9x^2 - 16$ **(3x+4)(3x-4)**
5. $4x^2 - 9$ **(2x+3)(2x-3)**	6. $x^2 - 25$ **(x+5)(x-5)**
7. $x^2 + 4$ **NOT FACTORABLE**	8. $4 - x^2$ **(2+x)(2-x)**
9. $x^2 - y^2$ **(x+y)(x-y)**	10. $49x^2 - 1$ **(7x+1)(7x-1)**

5. DOS with GCF

$(ax^2-ab^2)=a(x^2-b^2)=a(x+b)(x-b)$

Example Factor.

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

$243-75x^2 = 3(81-25x^2) = 3(9+5x)(9-5x)$

$75x^2-48 = 3(25x^2-16) = 3(5x+4)(5x-4)$

Practice Factor.

11. $3x^2 - 48 = 3(x^2 - 16)$ $= 3(x+4)(x-4)$	12. $32x^2 - 2$ $=2(16x^2-1)=2(4x+1)(4x-1)$
13. $50 + 8x^2$ **Not factorable=prime**	14. $98 - 2x^2$ $=2(49-x^2)=2(7+x)(7-x)$
15. $45x^2 - 5$ $=5(9x^2-1)=5(3x+1)(3x-1)$	16. $5x^2 - 20$ $=5(x^2-4)=5(x+2)(x-2)$
17. $4x^2 - 64y^2$ $=4(x^2-16y^2)$ $=4(x+4y)(x-4y)$	18. $100 + 25x^2$ **Not factorable=prime**
19. $2x^2 - 8$ $=2(x^2-4)=2(x+2)(x-2)$	20. $16x^2 - 76$ $=4(4x^2-19)$

Homework

Factor completely, if possible. If it's not factorable, put "prime". Then, double check your answer by foiling.

1) $9x^2 - 1$

2) $4n^2 - 49$

3) $36k^2 - 1$

4) $p^2 - 36$

5) $2x^2 - 18$

6) $196n^2 - 144$

7) $180m^2 - 5$

8) $294r^2 - 150$

9) $150k^2 - 216$

10) $20a^2 - 45$

11) $3n^2 - 75$

12) $24x^3 - 54x$

13) $a^2 - 25b^2$

14) $4x^2 + 49y^2$

15) $25x^2 + 16y^2$

16) $6a^2 + 96b^2$

17) $x^2 - 9y^2$

18) $49x^2 - 25y^2$

19) $9x^2 - 16y^2$

20) $54v^2 - 6u^2$

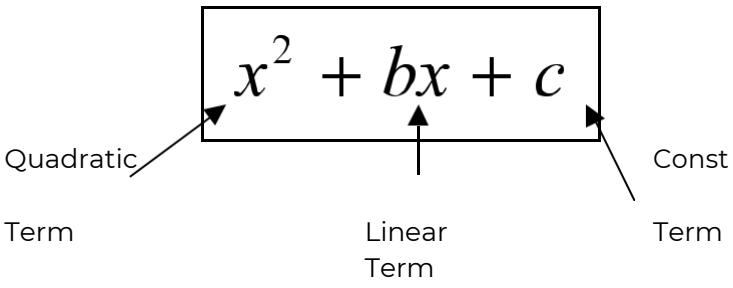
Answers to Factoring the Difference of Squares

1) $(3x+1)(3x-1)$
2) $(2n+7)(2n-7)$
3) $(6k+1)(6k-1)$
4) $(p+6)(p-6)$
5) $2(x+3)(x-3)$
6) $4(7n+6)(7n-6)$
7) $5(6m+1)(6m-1)$
8) $6(7r+5)(7r-5)$
9) $6(5k+6)(5k-6)$
10) $5(2a+3)(2a-3)$
11) $3(n+5)(n-5)$
12) $6x(2x+3)(2x-3)$
13) $(a+5b)(a-5b)$
14) Not factorable
15) Not factorable
16) $6(a^2+16b^2)$
17) $(x+3y)(x-3y)$
18) $(7x+5y)(7x-5y)$
19) $(3x+4y)(3x-4y)$
20) $6(3v+u)(3v-u)$

Factoring Trinomial Notes

Factored Form	Work	Trinomial
$(x + 3)(x - 2)$	$x^2 - 2x + 3x - 6$	$x^2 + x - 6$
$(x - 4)(x - 5)$	$x^2 - 5x - 4x + 20$	$x^2 - 9x + 20$
$(x + 1)(x + 6)$	$x^2 + 6x + 1x + 6$	$x^2 + 7x + 6$
$(x - 10)(x + 8)$	$x^2 + 8x - 10x - 80$	$x^2 - 2x - 80$

Trinomial has 3 terms.

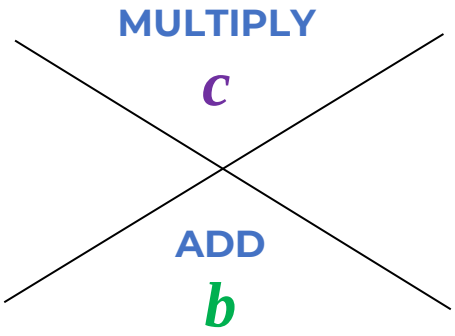


"a=1" Trinomials: The Leading Coefficient (in front of x^2) is _1_.

5. Factoring "a=1" Trinomials

$$x^2+bx+c=(x+\square)(x+\square)$$

$$\square\times\square=c, \qquad \square+\square=b$$



Method

1. Write down two pairs of parentheses.
2. Determine the factors of c.
3. Find the combination of factors that will add/subtract to equal b.
4. Place the values into the parentheses
5. Check using FOIL.

Example: Factor x^2 -3x -10

In-Class Example

1. Find 2 numbers that will multiply to 15 and add up to 8.

_+5 , _+3_

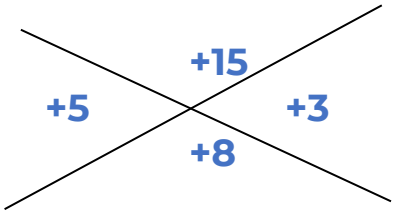
Multiply	Add
5x3=15	5+3=8

2. Find 2 numbers that will multiply to 8 and add up to 6.

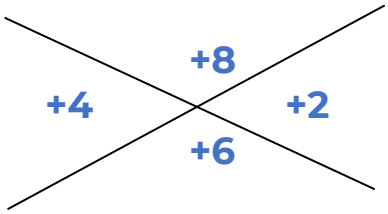
_+4_ , _+2_

Multiply	Add
4x2=8	4+2=6

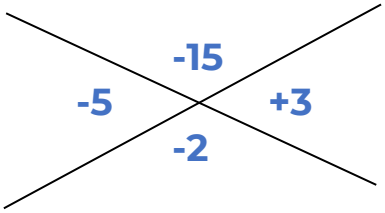
3. Factor $x^2+8x+15$= **(x+5)(x+3)**



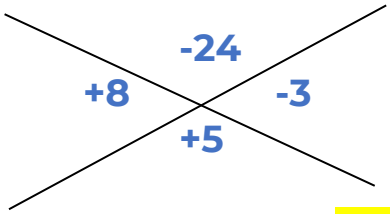
4. Factor x^2+6x+8= **(x+4)(x+2)**



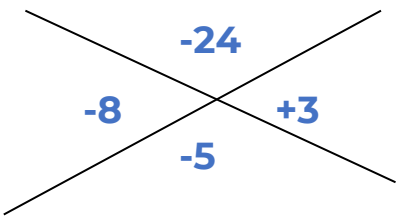
5. Factor $x^2-2x-15$= **(x-5)(x+3)**



6. Factor $x^2+5x-24$= **(x+8)(x-3)**



7. Factor $x^2-5x-24$= **(x-8)(x+3)**



Factoring Trinomials (a=1) In-Class Practice

Factor each trinomial (rewrite as a product of two binomials).

1. $x^2 + 6x + 5$ (x+5)(x+1)	4. $x^2 – 8x + 7$ (x-7)(x-1)
2. $x^2 + 4x + 3$ (x+3)(x+1)	5. $x^2 – 24x + 23$ (x-23)(x-1)
3. $x^2 + 12x + 11$ (x+1 1)(x+1)	6. $x^2 – 12x + 11$ (x-11)(x-1)
7. $x^2 – 2x – 3$ (x-3) (x+1)	10. $x^2 + 2x – 3$ (x+3)(x-1)
8. $x^2 – 12x – 13$ (x-13)(x+1)	11. $x^2 + 12x – 13$ (x+13)(x-1)
9. $x^2 – 6x – 7$ (x-7)(x+1)	12. $x^2 + 6x – 7$ (x+7)(x-1)

1. $x^2 + 5x + 6$ ( )( ) **X+3 x+2**	4. $x^2 – 11x + 10$ ( )( ) **x-10 x-1**
2. $x^2 +x -20$ ( )( ) **X+5 x-4**	5. $x^2 – 7x + 12$ ( )( ) **x-4 x-3**
3. $x^2 + 6x -16$ ( ) **X+8 x-2**	6. $x^2 – 3x -18$ ( ) **x-6 x+3**
7. $x^2 – 13x – 30$ ( ) **X-15 x+2**	10. $x^2 + 6x – 40$ ( ) **x+10 x-4**
8. $x^2 – x – 12$ ( ) **x-4 x+3**	11. $x^2 + x – 42$ ( ) **x+7 x-6**
9. $x^2 – x – 30$ ( )( ) **x-6 x+5**	12. $x^2 + 13x + 30$ ( )( ) **x+10 x+3**

Factoring Trinomials(a=1),GCF Homework-page 10

Algebra 2 Name: _____
Factoring Quadratic Expressions

Factor each expression.

1. $x^2 + 4x - 5$

=(x+5)(x-1)

2. $x^2 + 13x + 42$

=(x+7)(x+6)

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

Hint: factor out - first

= -(x²+x-12)= -(x+4)(x-3)

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

=(x-4)(x-4)

5. $-x^2 + 16x - 55$

= -(x²-16x+55)= -(x-11)(x-5)

6. $x^2 + 2x - 48$

=(x+8)(x-6)

7. $-y^2 + 17y - 72$

= -(y²-17y+72)= -(y-8)(x-9)

8. $x^2 + 7x + 12$

=(x+4)(x+3)

9. $x^2 - 8x + 12$

=(x-6)(x-2)

Find the GCF of each expression. Then factor the expression.

10. $3x^2 + 15x + 12$

= 3(x²+5x+4)
= 3(x+4)(x+1)

11. $-9y^2 + 6y$

= 3y(-3y+2)

12. $6x^2 + 12x - 48$

= 6(x²+2x-8)
= 6(x+4)(x-2)

13. $-3x^2 - 3x + 60$

= -3(x²+x-20)
= -3(x+5)(x-4)

14. $2x^2 - 10x$

= 2x(x-5)

15. $7x^2 - 14x - 56$

= 7(x²-2x-8)
= 7(x-4)(x+2)

16. $10x^2 + 100x$

= 10x(x+10)

17. $9x^2 - 36x + 27$

= 9(x²-4x+3)
= 9(x-3)(x-1)

18. $-5x^2 - 30x - 25$

= -5(x²+6x+5)
= -5(x+5)(x+1)

21. Multiple Choice What is the factored form of $-14a^2 + 42ab$? **D**

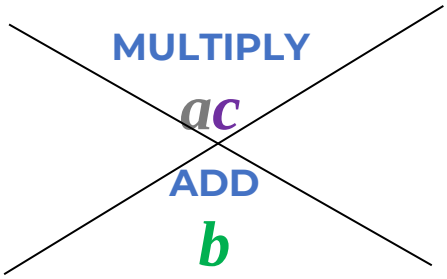
A $a(-14a + 42b)$
B $-2a(7a - 21b)$
C $7(-2a^2 + 6ab)$
D $-14a(a - 3b)$

Factored Form	Work	Trinomial
$(3x + 2)(2x - 4)$	$6x^2 - 12x + 4x - 8$	$6x^2 - 8x - 8$
$(5x - 3)(6x + 2)$	$30x^2 + 10x - 18x - 6$	$30x^2 - 8x - 6$
$(2x - 3)(x - 5)$	$2x^2 - 10x - 3x + 15$	$2x^2 - 13x + 15$

6. Factoring "a>1" Trinomials

$$ax^2+bx+c=(x+\square)(x+\square)$$

$$\square\times\square=ac, \qquad \square+\square=b$$



Method

1. Write down two pairs of parentheses.
2. Determine the factors of ac.
3. Find the combination of factors that will add/subtract to equal b. let them be m&n.
4. Rewrite the trinomial as

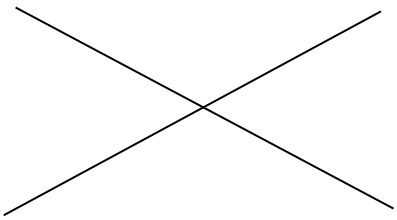
$$ax^2+mx+nx+c$$

5. Group them into (two)+(two) as

$(ax^2+mx)+(+nx+c)$. Factor out the GCF from each group.

6. Place the values into the parentheses
7. Check using FOIL.

Example : Factor $3x^2-13x-10$



Factoring Trinomials (a>1) In-Class Practice

Factor each expression below using all the techniques we learned so far:

1. $2x^2 + 7x + 6$ $2x^2 + 3x + 4x + 6$ $(x+2)(2x+3)$	**2.** $3x^2 - 14x - 24$ $3x^2 + 4x - 18x - 24$ $(x-6)(3x+4)$
3. $5x^2 - 22x + 21$ $5x^2 - 15x - 7x + 21$ $(x-3)(5x-7)$	**4.** $4x^2 + 18x + 8$ $2(2x^2 + 9x + 4)$ $2(2x^2+8x+1x+4)$ $2(x+4)(2x+1)$
5. $2x^2 - 8x + 6$ $2(x^2-4x+3)$ $2(x^2-3x-x+3)$ $2(x-3)(x-1)$	**6.** $6x^2 + 13x - 28$ $6x^2 + 21x - 8x - 28$ $(2x+7)(3x-4)$
7. $4x^2 - 4x + 1$ $4x^2 - 2x - 2x + 1$ $(2x-1)(2x-1)$ $(2x-1)^2$	**8.** $x^2 + 6x + 9$ $x^2 + 3x + 3x + 9$ $(x+3)(x+3)$ $(x+3)^2$
9. $16x^2 - 40x + 25$ $16x^2 - 20x - 20x + 25$ $(4x-5)(4x-5)$ or $(4x-5)^2$	**10.** $9x^2 - 36x + 36$ $9(x^2 - 4x + 4)$ $9(x^2 - 2x - 2x + 4)$ $9(x-2)(x-2)$ or $9(x-2)^2$

Factoring Trinomials (a>1) Homework - Page 13

Factor Completely.

1) $7m^2 + 6m - 1$

2) $3k^2 - 10k + 7$

3) $5x^2 - 36x - 81$

4) $2x^2 - 9x - 81$

5) $3n^2 - 16n + 20$

6) $2r^2 + 7r - 30$

7) $5k^2 + 8k + 80$

8) $5x^2 - 14x + 8$

9) $7p^2 - 20p + 12$

10) $3v^2 + 14v - 49$

11) $7x^2 - 26x - 45$

12) $5p^2 - 52p + 20$

13) $5x^2 - 43x + 24$

14) $5x^2 + 26x + 24$

15) $3r^2 + 40r + 100$

16) $2x^2 - 3x - 5$

17) $5p^2 + 19p + 12$

18) $2m^2 + 3m - 27$

19) $3n^2 + 10n - 8$

20) $2a^2 + 7a - 7$

Answers

1) $(7m - 1)(m + 1)$
2) $(3k - 7)(k - 1)$
3) $(5x + 9)(x - 9)$
4) $(2x + 9)(x - 9)$
5) $(3n - 10)(n - 2)$
6) $(2r - 5)(r + 6)$
7) Not factorable
8) $(5x - 4)(x - 2)$
9) $(7p - 6)(p - 2)$
10) $(3v - 7)(v + 7)$
11) $(7x + 9)(x - 5)$
12) $(5p - 2)(p - 10)$
13) $(5x - 3)(x - 8)$
14) $(5x + 6)(x + 4)$
15) $(3r + 10)(r + 10)$
16) $(2x - 5)(x + 1)$
17) $(5p + 4)(p + 3)$
18) $(2m + 9)(m - 3)$
19) $(3n - 2)(n + 4)$
20) Not factorable

Algebra 2 Name: _____
Solving Quadratic using factoring

Solve quadratics using the factoring method.

Steps

1.Rearrange the terms to set up the equation in the standard form.

$ax^2 + bx + c = 0$

2. factor the left side.

$(x-m)(x-n) = 0$

3. Set the terms inside each parenthesis equal to 0.

$(x-m)=0$, $(x-n) = 0$

$x=m$ $x=n$

4. Plug in the solution(s) to the original equation and check your answer(s)!

Factoring Method 1. Solve for x using a=1 factoring method.

EXAMPLE

$x^2 + 13x = 30$

-30 -30

$x^2 + 13x - 30 = 0$

$(x+15)\cdot(x-2)=0$

x+15=0, x-2=0

x= -15 , x=2 $2^2 + 13\cdot 2 = 30$ YES!

PRACTICE

1. $x^2 + 4x - 5=0$ $(x+5)(x-1)=0$ $(x+5)=0$, $(x-1)=0$ ***x= -5, x=1***	**2.** $x^2 + 13x = 42$ $x^2 + 13x - 42=0$ ***NOT Factorable***
3. $-x^2 - x + 12=0$ $-(x^2 + x - 12)=0$ $-(x+4)(x-3)=0$ $(x+4)=0$, $(x-3)=0$ ***x= -4, x=3***	**4.** $x^2 - 8x = -16$ $x^2 - 8x +16=0$ $(x-4)(x-4)=0$ $(x-4)=0$, $(x-4)=0$ ***x= 4***
5. $-x^2 + 16x = 55$ $-x^2 + 16x - 55=0$ $-(x^2 - 16x +55)=0$ $-(x-11)(x-5)=0$ $(x-11)=0$, $(x-5)=0$ ***x= 11, x=5***	**6.** $x^2 = 8x -12$ $x^2 - 8x +12=0$ $(x-6)(x-2)=0$ $(x-6)=0$, $(x-2)=0$ ***x= 6,2***

Factoring Method 2. Solve for x using GCF & a=1 factoring method.

Example

$-2x^2 + 4x = -30$ *(There's a change to the question*)*

$-2x^2 + 4x + 30 = 0$

$-2(x^2 - 2x - 15) = 0$

$-2(x-5)(x+3) = 0$

$(x-5) = 0,\ (x+3) = 0$

$x = 5, -3$

Practice

7. $3x^2 + 15x + 12 = 0$ $3(x^2 + 5x + 4) = 0$ $3(x+4)(x+1) = 0$ $x+4 = 0,\ x+1 = 0$ $x = -4, -1$	***8.*** $9x^2 - 36x = -27$ $9x^2 - 36x + 27 = 0$ $9(x^2 - 4x + 3) = 0$ $9(x-3)(x-1) = 0$ $x-3 = 0,\ x-1 = 0$ $x = 3, 1$
9. $6x^2 + 12x = 48$ $6x^2 + 12x - 48 = 0$ $6(x^2 + 2x - 8) = 0$ $6(x-2)(x+4) = 0$ $x-2 = 0,\ x+4 = 0$ $x = 2, -4$	***10.*** $-3x^2 - 3x = -60$ $-3x^2 - 3x + 60 = 0$ $-3(x^2 + x - 20) = 0$ $-3(x+5)(x-4) = 0$ $x+5 = 0,\ x-4 = 0$ $x = -5, 4$

Factoring Method 3. Solve for x using a>1 factoring method.

Example

$2x^2 - 5x = 3$

$2x^2 - 5x - 3 = 0$

$2x^2 + x - 6x - 3 = 0$

$(x-3)(2x+1) = 0$

$x-3 = 0,\ 2x+1 = 0$

$x = 3,\ x = -1/2$

Practice

11. $2x^2 - 6x - 8 = 0$ $2(x^2 - 3x - 4) = 0$ $2(x-4)(x+1) = 0$ $x-4 = 0,\ x+1 = 0$ $x = 4,\ x = -1$	***12.*** $6x^2 + 7x = 5$ $6x^2 + 7x - 5 = 0$ $6x^2 + 10x - 3x - 5 = 0$ $(2x-1)(3x+5) = 0$ $2x-1 = 0,\ 3x+5 = 0$ $x = 1/2,\ x = -5/3$
13. $-2x^2 - 3x + 2 = 0$ $-(2x^2 + 3x - 2) = 0$ $-(2x-1)(x+2) = 0$ $2x-1 = 0,\ 2x+2 = 0$ $x = 1/2,\ x = -1$	***14.*** $3x^2 - 5x = 2$ $3x^2 - 5x - 2 = 0$

Factoring Method 4. Solve for x binomial factoring method.

Example

$x^2 - 4 = 0$

$(x+2)(x-2)=0$

$(x+2)=0, \quad (x-2)=0$

$x = -2, 2$

$x^2 - 4x = 0$

$x \cdot (x-4)=0$

$x=0, \quad (x-4)=0$

$x=0, 4$

Practice

15. $x^2 - 9 = 0$ $(x+3)(x-3)=0$ $(x+3)=0, \quad (x-3)=0$ **$x = -3, 3$**	**16.** $4x^2 - 9 = 0$ $(2x+3)(2x-3)=0$ $(2x+3)=0, \quad (2x-3)=0$ **$x = -3/2, 3/2$**
17. $x^2 = 16$ $x^2 - 16=0$ $(x+4)(x-4)=0$ $(x+4)=0, \quad (x-4)=0$ **$x = -4, 4$**	**18.** $-9x^2 + 1 = 0$ $-(9x^2 - 1) = 0$ $-(3x+1)(3x-1)=0$ $(3x+1)=0, \quad (3x-1)=0$ **$x = -1/3, 1/3$**
19. $x^3 - 4x = 0$ $x(x^2 - 4)=0$ $x(x+2)(x-2)=0$ $x=0, (x+2)=0, \quad (x-2)=0$ **$x = 0, -2, 2$**	**20.** $x^4 - 4x^2 = 0$ $x^2 (x^2 - 4)=0$ $x^2 (x+2)(x-2)=0$ $x^2 =0, \quad (x+2)=0, \quad (x-2)=0$ **$x = 0, -2, 2$**
21. $x^3 - 3x^2 = 0$ $x^2 (x-3)=0$ $x^2 =0, \quad (x-3)=0$ **$x = 0, 3$**	**22.** $2x^2 - 10x = 0$ $2x(x-5)=0$ $2x=0, \quad (x-5)=0$ **$x = 0, 5$**

Mixed Review Practice

Factor each expression below:

23. $2x^2 + 7x + 6 = 0$

$2x^2 + 4x + 3x + 6 = 0$
$(2x+3)(x+2)=0$
$(2x+3) = 0 \quad (x+2)=0$
$x = -3/2 \quad x = -2$

24. $3x^2 - 14x - 24 = 0$

$3x^2 - 18x + 4x - 24 = 0$
$(3x+4)(x-6)=0$
$(3x+4) = 0 \quad (x-6)=0$
$x = -4/3 \quad x = 6$

25. $5x^2 - 22x + 21 = 0$

$5x^2 - 15x - 7x + 21 = 0$
$(5x-7)(x-3)=0$
$(5x-7) = 0 \quad (x-3)=0$
$x = 7/5 \quad x = 3$

26. $4x^2 + 18x + 8 = 0$

$2(2x^2 + 9x + 4)=0$
$2(2x^2 + 8x + x + 4)=0$
$2(2x+1)(x+4)=0$
$(2x+1) = 0 \quad (x+4)=0$
$x = -1/2 \quad x = -4$

27. $2x^2 - 8x + 6 = 0$

$2(x^2 - 4x + 3)=0$
$2(x-3)(x-1)=0$
$(x-3) = 0 \quad (x-1)=0$
$x = 3 \quad x = 1$

28. $6x^2 + 13x - 28 = 0$

$6x^2 + 21x - 8x - 28 = 0$
$(2x+7)(3x-4)=0$
$(2x+7) = 0 \quad (3x-4)=0$
$x = -7/2 \quad x = 4/3$

29. $4x^2 - 4x + 1 = 0$

$(2x-1)(2x-1)=0$
$(2x-1) = 0 \quad (2x-1)=0$
$x = 1/2$

30. $x^2 + 6x + 9 = 0$

$(x+3)(x+3)=0$
$(x+3) = 0 \quad (x+3)=0$
$x = -3$

31. $4x^2 - 16 = 0$

$4(x^2-4)=0$
$4(x+2)(x-2)=0$
$(x+2)=0, \quad (x-2)=0$
$x = -2,2$

32. $9x^2 - 4 = 0$

$(3x+2)(3x-2)=0$
$(3x+2) = 0 \quad (3x-2)=0$
$x = -2/3, 2/3$

33. $16x^2 - 40x + 25 = 0$

$(4x-5)(4x-5)=0$
$(4x-5)=0 \quad (4x-5)=0$
$x = 5/4$

34. $x^2 - 25 = 0$

$(x+5)(x-5)=0$
$(x+5)=0, \quad (x-5)=0$
$x = -5,5$

35. $9x^2 - 36x + 36 = 0$

$9(x^2 - 4x + 4)=0$
$9(x-2)(x-2)=0$
$(x-2)=0 \quad (x-2)=0$
$x = 2$

36. $18x^2 = -9x$

$18x^2 + 9x = 0$
$9x(2x+1)=0$
$x = 0 \quad (2x+1)=0$
$x = 0, -1/2$

37. $4x^2 + 24x + 36 = 0$

$4(x^2+6x+9)=0$
$4(x+3) = 0$
$x = -3$

Quadratics by Factoring Homework page 18-19

Solve each equation by factoring. Check your answers.

1. $x^2 - x - 30 = 0$

(x-6)(x+5)=0
X=-6,-5

2. $x^2 - 10x = -21$

(x-3)(x-7)=0
x=3,7

3. $x^2 = -10x - 9$

(x+9)(x+1)=0
x=-9,-1

4. $x^2 - 5x = 0$

x(x-5)=0
X=0,5

5. $10x - 24 = x^2$

(x-6)(x-4)=0
x=6,4

6. $x^2 = -12x$

x(x+12)=0
x=0,-12

7. $-y^2 + 17y = 72$

-(y-8)(y-9)=0
X=8,9

8. $x^2 + 7x + 12=0$

(x+4)(x+3)=0
x=-4,-3

9. $x^2 = 8x - 12$

(x-2)(x-6)=0
x=2,6

10. $3x^2 + 15x + 12 = 0$

3(x+4)(x+1)=0
X=-4,-1

11. $-9x^2 + 6x = 0$

-3x(3x-2)=0
x=0,2/3

12. $6x^2 + 12x = 48$

6(x+2)(x-4)=0
x=-2,4

13. $3x^2 = -3x + 60$
3(x-4)(x+5)=0
X=4,-5

14. $2x^2 - 10x = 0$
2x(x-5)=0
x=0,5

15. $7x^2 - 14x = 56$
7(x+2)(x-4)=0
x=-2,4

16. $2x^2 + 7x = -6$
(2x+3)(x+2)=0
X=-2,-3/2

17. $4x^2 = 16$
4(x^2-4)=0
x=-2,2

18. $5x^2 - 22x + 21 = 0$
(x-3)(5x-7)=0
x=3,7/5

19. $4x^2 + 18x = -8$
2(x+4)(2x+1)=0
X=-4,-1/2

20. $2x^2 - 8x + 6 = 0$
2(x-1)(x-3)=0
x=1,3

21. $6x^2 + 13x - 28 = 0$
(2x-7)(3x+4)=0
x=7/2,-4/3

22. $9x^2 = 4$
(3x+2)(3x-2)=0
X=-2/3, 2/3

23. $16x^2 - 40x + 25 = 0$
(4x-5)(4x-5)=0
x=5/4

24. $x^2 - 25 = 0$
(x+5)(x-5)=0
x=-5,5

Algebra II
Graphing Quadratics

Name:_____
Date: _____Pd: ____

Notes on **How to graph** a function on TI-84

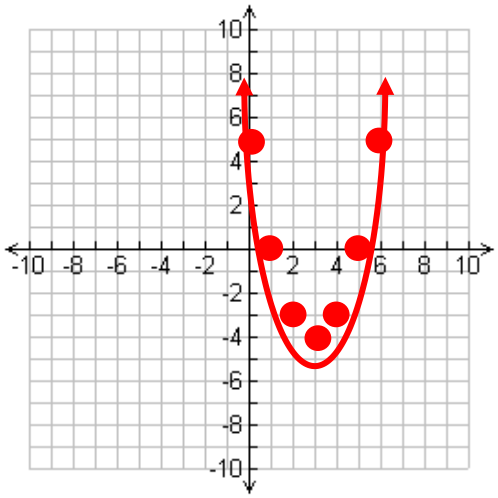
First, click on _y=_ button to put in the function. Then click on _graph button to graph.
After checking the graph,

- find the vertex by using the TRACE button_.
- Find the x-intercept by clicking on TRACE button. Then, find 2 points that the graph intersects with the x-axis. **(x1,0), (x2,0)**
- Find the y-intercept by clicking on TRACE button. Then, find a point that the graph intersects with the y-axis. **(0,y)**

How to find the domain?
R
How to find the range?
From bottom to up, find the y-values.
How to find the increasing interval?
From left to right, find the x-values of the increasing interval.
How to find the decreasing interval?
From left to right, find the x-values of the decreasing interval.

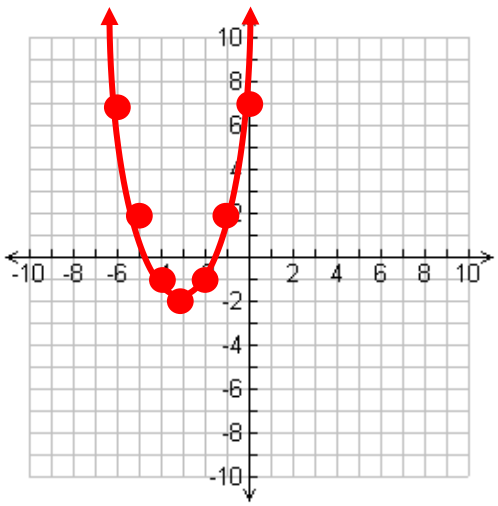
EXAMPLE Graph and answer the following.

1.) $y=(x-3)^2-4$



Vertex: **(3,-4)**
x-intercept: **(1,0),(5,0)**
y-intercept: **(0,5)**
Domain: **R**
Range: **(-4,∞)**
Increasing: **[3,∞)**
Decreasing: **(-∞,3]**

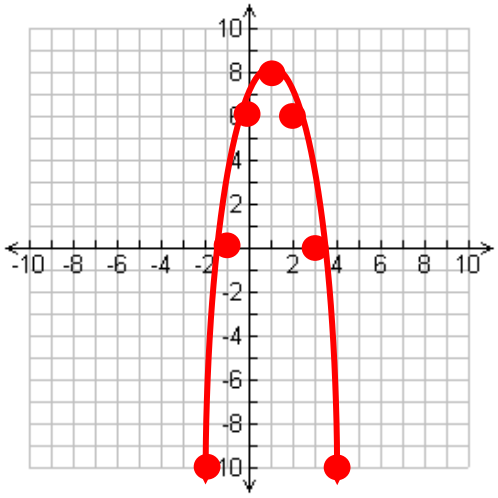
2.) $y=x^2+6x+7$



Vertex: **(-3,-2)**
x-intercept: **(-4.5,0),(-1.6,0)**
y-intercept: **(0,7)**
Domain: **R**
Range: **(-2, ∞)**
Increasing: **(-3, ∞)**
Decreasing: **(-∞,-3)**

PRACTICE

3.) $y = -2(x-3)(x+1)$



Vertex: (1,8)

x-intercept: (-1,0),(3,0)

y-intercept: (0,6)

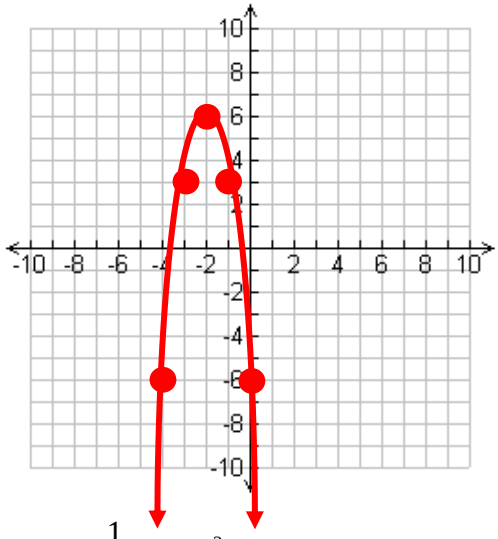
Domain: R

Range: (-∞,8]

Increasing: (-∞,1)

Decreasing: (1,∞)

4.) $y = -3x^2 - 12x - 6$



Vertex: (-2,6)

x-intercept: (-3.4,0),(-.6,0)

y-intercept: (0,-6)

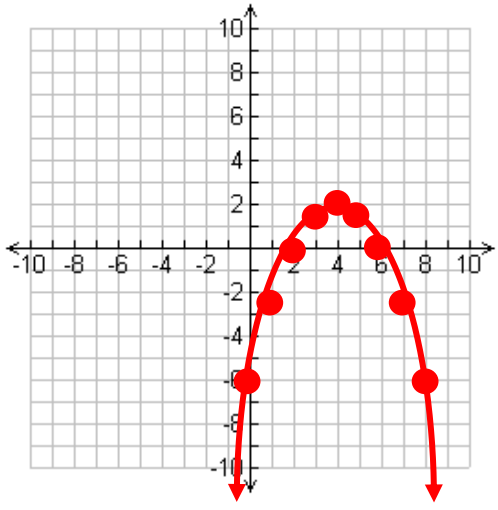
Domain: R

Range: (-∞,6]

Increasing: (-∞,-2)

Decreasing: (-2,∞)

5.) $y = -\frac{1}{2}(x-4)^2 + 2$



Vertex: (4,2)

x-intercept: (2,0),(6,0)

y-intercept: (0,-6)

Domain: R

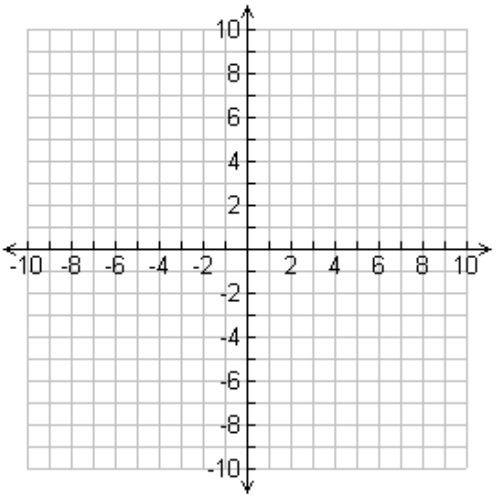
Range: (-∞,2]

Increasing: (-∞,4)

Decreasing: (4,∞)

Graphing Quadratics Homework page 22-23

1) $y = -x^2 - 4x - 3$



Vertex: _____

x-intercept: _____

y-intercept: _____

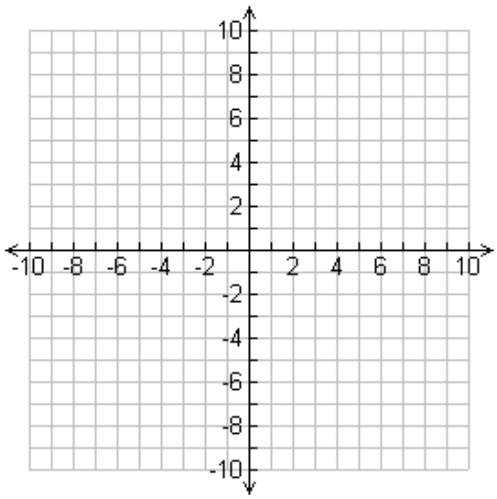
Domain: _____

Range: _____

Increasing: _____

Decreasing: _____

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



Vertex: _____

x-intercept: _____

y-intercept: _____

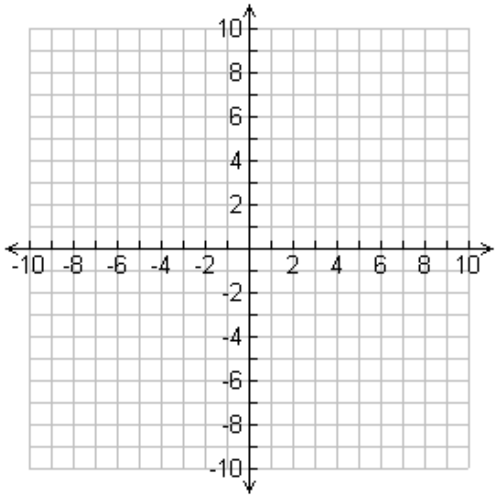
Domain: _____

Range: _____

Increasing: _____

Decreasing: _____

3) $y = \frac{1}{3}(x+1)^2 - 3$



Vertex: _____

x-intercept: _____

y-intercept: _____

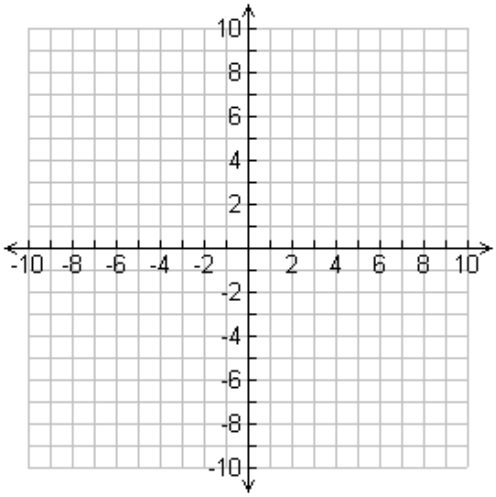
Domain: _____

Range: _____

Increasing: _____

Decreasing: _____

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



Vertex: _____

x-intercept: _____

y-intercept: _____

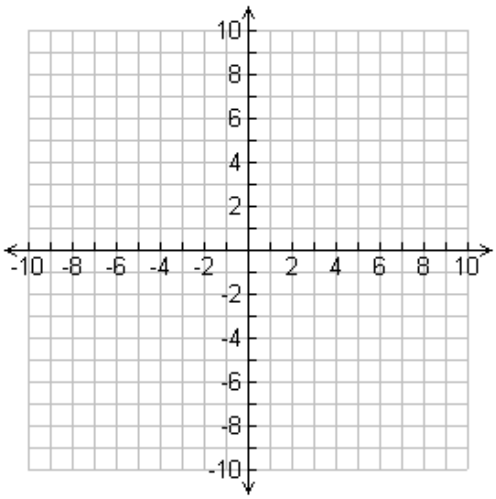
Domain: _____

Range: _____

Increasing: _____

Decreasing: _____

5) $y = \frac{1}{2}(x-1)^2 - 4$



Vertex: _____

x-intercept: _____

y-intercept: _____

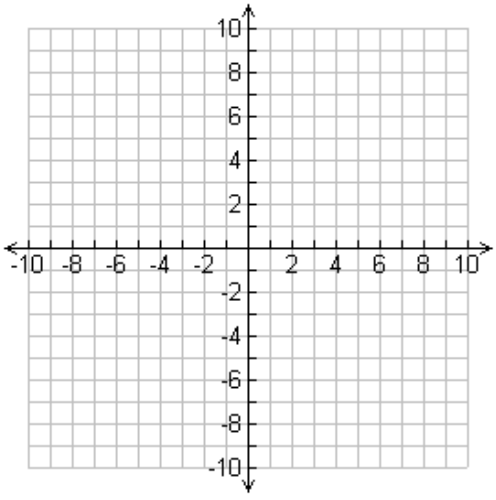
Domain: _____

Range: _____

Increasing: _____

Decreasing: _____

6) $y = (x-2)(x-4)$



Vertex: _____

x-intercept: _____

y-intercept: _____

Domain: _____

Range: _____

Increasing: _____

Decreasing: _____