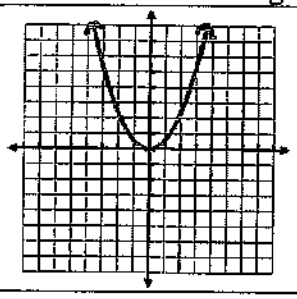
Name: Key Algebra II – Semester Test 12/15/2016

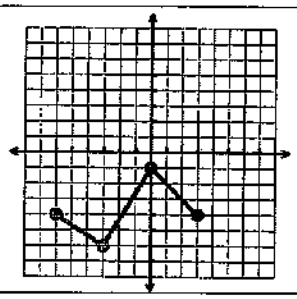
1) What is the domain and range of the following graphs?

(4)

a) 

D: $(-\infty, \infty)$

R: $[0, \infty)$

b) 

D: $[-6, 3]$

R: $[6, -1]$

2) Find the equivalent sets for the following:

(4) a) $\{2,3,4,5\} \cap \{2,4,6,8\}$ $\{2,4\}$ | b) $\{2,3,4,5\} \cup \{2,4,6,8\}$ $\{2,3,4,5,6,8\}$

3) Simplify the following expressions. Leave your answers in exponent form with positive exponents.

(4) a) $\frac{15x^9y^5}{20x^4y^9}$ $\frac{3x^5}{4y^4}$ | b) $(4^3x^9y^3 * x^2)^6$ $4^{18}x^{66}y^{18}$

4) Shade in the following Venn diagrams for the names given.

(2) a) $A' \cap B$ b) $A' \cap B'$

5) Solve, graph, and write your answer in interval notation for following inequality

(6) a) $5 \leq 4b - 3 < 9$ $+3 \quad +3 \quad +3$ $\frac{8}{4} \leq \frac{4b}{4} < \frac{12}{4}$ $2 \leq b < 3$ | b) $x + 2 < -2$ OR $x - 2 > 2$ $-2 \quad -2$ $x < -4$ $x > 4$ $-4 \quad 4$

6) Simplify each polynomial expression.

(4) a) $3x^3 - 18x^4 + 5 + 7x^3 - 4x^2 - 9x^4$ | b) $(-x^2 + x^2y - y^2) + (+2y^2 \mp x^2 \mp xy^2)$

7) Classify the following polynomials by their degree and number of terms.

(4) a) $x^3 + 3x$ | b)) 2^4

8) Find the domain of the following functions:

(6) (4) a) $f(x) = \frac{x+8}{7x-14} = 0$ $x \neq 2$. | b) $f(x) = x^3 + 4$

9) Rationalize/simplify the following radicals.

(6) a) $\sqrt[2]{\frac{1}{3} \cdot 3}$ $\sqrt[2]{3-3}$ $\frac{1}{3}\sqrt{3}$ | b) $\frac{8}{\sqrt[4]{x}} \cdot \frac{\sqrt[4]{x \cdot x \cdot x}}{\sqrt[4]{x \cdot x \cdot x}}$

10) Put the following polynomials in standard form and identify the leading coefficient.

(4) a) $9x^7 + 3x^4 - 8x^9$ | b) $6x^2 - x^3 + 8^5 - 3x^4 + 2x^{10}$

11) Solve, graph, and write your answer in interval notation for the following inequalities.

(6) a) $-2(7x + 15) < 14$ $-14x - 30 < 14$ $+30 \quad +30$ $\frac{-14x}{-14} < \frac{44}{-14}$ $x > 3.14$ -3.14 | b) $-2x + 9 - 10 \geq 3(9x + 16)$ $-2x - 1 \geq 27x + 48$ $+2x \quad -48 \quad +2x - 48$ $\frac{-49}{29} \geq \frac{29x}{29}$ $x \leq \frac{-49}{29}$ $-49/29$ -1.69.

12) Solve, graph, and write your answer in interval notation for the following inequalities. Be sure to show all your work!!! Leave your answers in the simplest fraction form. (6)

a) $-(6x+6)-5>1-6x$ $\quad -11>1$

b) $-1+5x \le 3x+2x$ $\quad -1 \le 0.$

13) Simplify the following radicals. (6)

a) $\sqrt[4]{x^8y^{13}}$ $\quad x^2y^3\sqrt[4]{y}$

b) $\sqrt[3]{32x^8y^{15}}$ $\quad 2x^2y^5\sqrt[3]{4x^2}$

14) Identify the independent and dependent variables in the following scenarios. (4)

a) The more questions I put on a test, the more problems you get wrong.

b) Your IQ goes up as you take more classes.

c) There are fewer seats to sit in as students come to class.

d) As the cold weather settles in ND, the more animals go into hibernation.

15) Multiply the following polynomials. (6)

a) $(2x+4)(x^2-7x+3)$

b) $(x-3)^2$

	x^2	$-7x$	$+3$
$2x$	$2x^3$	$-14x^2$	$6x$
4	$4x^2$	$-28x$	12

16) Fill in the missing information. (2)

Function Notation	Name	Graph
$f(x)=x^2$		

17) Write the following in words. Do NOT solve it. (4)

a) $6-\frac{x}{3}>4$

b) $7-x \le 8$

18) a) With radicals, we do not want a _____ in the _____, and we do not want a _____ in the _____. (6)

b) In the radical $\sqrt[4]{\ }$, 4 is the _____. We say it is a _____ for _____ deal.

c) With a power to a power, you _____ the exponents. (ex. $(x^2)^3$)

d) When multiplying with the same _____, you keep the base and _____ the _____.

19) I pay \$10/month for AmazonPrime. I also rent movies from Amazon that cost \$3.99 for a month's rental of the movie. (3)

a) Write an equation that represents how much I will be charged each month by Amazon.

b) How much do I get charged for renting 5 movies in one month?

20) Solve the following inequalities, graph your answer, and write it in interval notation: (3)

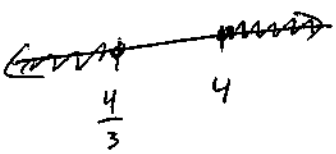
$$|3x-8| \ge 4$$

$3x-8 \ge 4$ $\quad -3x+8 \ge 4$

$+8\ +8$ $\quad -8\ -8$

$3x \ge 12$ $\quad -3x \ge -4$

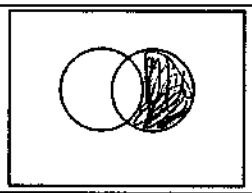
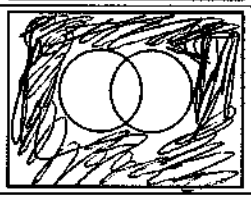
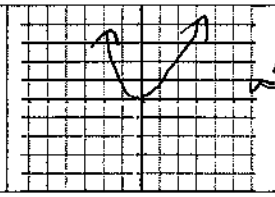
$x \ge 4$ OR $x \le \frac{4}{3}$



Algebra II

Key

ANSWERS ONLY!!

1A)	D: $(-\infty, \infty)$	R: $[0, \infty)$	11A)	$(3.14, \infty)$
1B)	D: $[-6, 3]$	R: $[-6, -1]$	11B)	$(-\infty, -1.69]$
2A)	$\{2, 4\}$		12A)	no soln
2B)	$\{2, 3, 4, 5, 6, 8\}$		12B)	All Reals.
3A)	$3x^5/4y^4$		13A)	$x^2y^3\sqrt[4]{y}$
3B)	$4^{18}x^{466}y^{18}$.		13B)	$2x^2y^5\sqrt[3]{4x^2}$
4A)			14A)	I: questions D: wrong
			14B)	I: classes D: I a
4B)			14C)	I: students D: seats
			14D)	I: weather D: animals.
5A)	$[2, 3)$		15A)	$2x^3 - 10x^2 - 32x + 12$.
5B)	$(-\infty, -4) \cup (4, \infty)$		15B)	$x^2 - 6x + 9$.
6A)	$-27x^4 + 10x^3 - 4x^2 + 5$.		16A)	quadratic  parabola
6B)	$-2x^2 + y^2 + x^2y - xy^2$.		17A)	6 minus x divided by 3 is greater than 4.
7A)	Cubic binomial.		17B)	7 minus x is less than or equal to 8.
7B)	constant. monomial.		18A)	$\sqrt{\ }$ $\quad$ $\frac{1}{\square}$ $\frac{1}{\square}$ $\quad$ $\sqrt{\ }$
8A)	$(-\infty, 2) \cup (2, \infty)$		18B)	index $\quad$. 4 $\quad$ 1
8B)	$(-\infty, \infty)$		18C)	multiply
9A)	$\frac{1}{3}\sqrt{3}$		18D)	base $\quad$ add exponents.
9B)	$8\sqrt[4]{x^3}/x$		19A)	$3.99x + 10 = f(x)$
10A)	$-8x^9 + 9x^7 + 3x^4$ $\frac{LC}{-8}$		19B)	$f(5) = 29.95$
10B)	$2x^{10} - 3x^4 - x^3 + 6x^2 + 8^5$		20)	$(-\infty, \frac{4}{3}] \cup [4, \infty)$

$\frac{LC}{2}$.

4 bit adder.

8 switches.

half adder
- 1 ~~ex~~ XOR
- 1 And.

Full Adder
- 2 Half adder = 2 XOR, 1 Add.
- 1 OR

3 full adder = 6 XOR, 3 And.

1 half adder = 1 XOR 1 And.

- 7 XOR. — 2 7486 chip.
- 4 and. — 1 7408 chip.
- 8 switches
- 5 LED.

Name: key
Algebra II – Test 4
1/31/2017

1) Given the following functions: I) Identify the parent function and II) Describe the transformations done to the parent function.

a) $f(x) = (x+3)^3 - 2$

I) cubic

II) left 3, down 2

b) $f(x) = -\sqrt{2x} + 1$

I) square root

II) reflection across x-axis, horizontal compression, up 1.

(6)

2) Find the GCF of each pair of numbers.

a) $8x^2, 12x$ — $8x^2 = 2^3 x^2$, $12 = 2^2 \cdot 3x$, $2^2, x$, $4x$

b) $-18x^6, 16x^8$ — $18 = 2 \cdot 3^2 x^6$, $16 = 2^4 x^8$, $2 \cdot x^6$

c) $36x^3y^4, 30x^5y^4$ — $36 = 2^2 \cdot 3^2 x^3 y^4$, $30 = 2 \cdot 3 \cdot 5 x^5 y^4$, $2 \cdot 3 \cdot x^3 y^4$, $6x^3y^4$

d) $35xy^3, 45x^5y^4$ — $35 = 5 \cdot 7 x y^3$, $45 = 3^2 \cdot 5 x^5 y^4$, $5 x y^3$

(8)

3) What does it mean to factor something?

write as a product.

(2)

4) Given the following information, find the equation of the line in slope-intercept form.

a) Slope: 2, y-intercept: -8 — (1) $y = 2x - 8$

b) Slope: 2, Passes through: (5, 6) — (2) $6 = 2(5) + b$, $b = -4$, $y = 2x - 4$

c) Passes through: (2, −3) & (6, 9) — (3) $\frac{12}{4} = 3$, $-3 = 3(2) + b$, $b = -9$, $y = 3x - 9$

(6)

5) Describe the following general transformations.

a) $f(x) \to f(x-4)$ right 4

b) $f(x) \to f(4x)$ horizontal compression by $\frac{1}{4}$

c) $f(x) \to 4f(x)$ vertical stretch by 4

d) $f(x) \to f(x) - 4$ down 4

e) $f(x) \to f(-x)$ reflection across y-axis

f) $f(x) \to -f(x)$ reflection across x-axis.

(6)

6) What is the prime factorization of the following numbers?

a) $60 = 2^2 \cdot 3 \cdot 5$

b) $63 = 3^2 \cdot 7$

c) $28 = 2^2 \cdot 7$

d) $49 = 7^2$

(6)

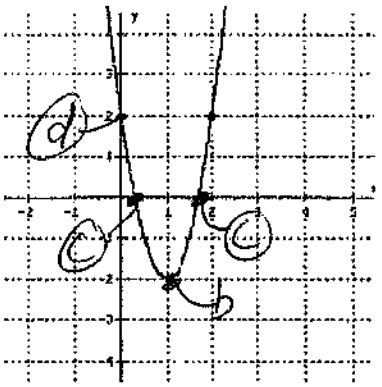
7) a) Write a quadratic equation to represent the following graph of a parabola. $f(x) = 4(x-1)^2 - 2$

b) Label the vertex (b)

c) Label the zeros (c)

d) Label the y-intercept (d)

(4)

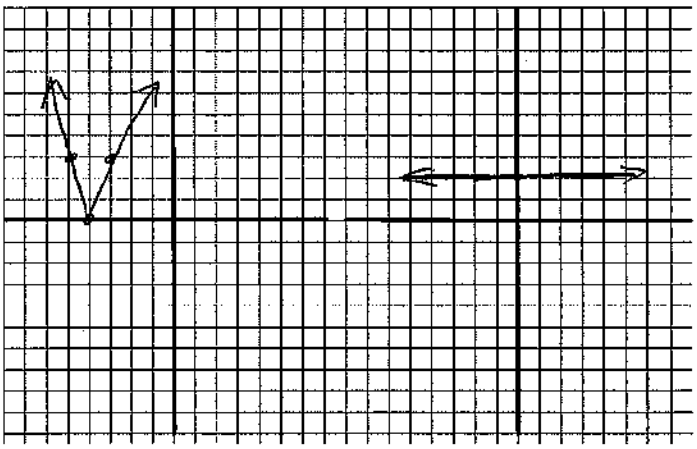


8) Graph the following functions.

a) $f(x) = 3|x+4|$

b) $f(x) = 2$

(4)



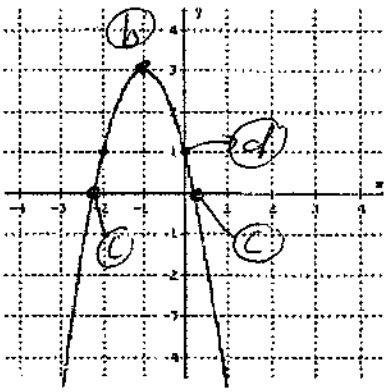
9) a) Write a quadratic equation to represent the following graph of a parabola. $f(x) = -(x+1)^2 + 3$

b) Label the vertex (b)

c) Label the zeros (c)

d) Label the y-intercept (d)

(4)



10) List the 6 parent functions by name AND function notation.

(6)

constant	$f(x) = b$
linear	$f(x) = x$
quadratic	$f(x) = x^2$
cubic	$f(x) = x^3$
absolute value	$f(x) = \|x\|$
square root	$f(x) = \sqrt{x}$

Name: Key. 2/22/2017 Algebra II – Test 5

1) Factor the following polynomials.

a) $x^2 + 16x + 28$ $(x+14)(x+2)$

b) $x^2 + 3x - 10$ $(x+5)(x-2)$

c) $x^2 - 7x + 12$ $(x-3)(x-4)$

d) $x^2 + 11x + 10$ $(x+10)(x+1)$

2) Fill in the blanks for the steps to factor things completely

a) GCF
-Watching to make sure the first term is positive

b) Grouping
-if more than 4 terms.

c) ac-method with □ and ○
-if a trinomial

d) Binomial
-Check for diff. of 2□ (special case)

3) What does it mean to factor something?

write as a product.

4) Factor each polynomial by grouping.

a) $10x^3 - 16x^2 + 25x - 40$

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

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

b) $x^3 - 4x - 16 + 4x^2$

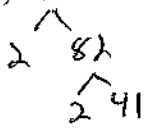
$x(x^2-4) + 4(x^2-4)$

$(x+4)(x^2-4)$ ok.

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

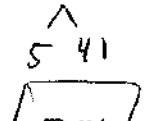
5) What is the prime factorization of the following numbers?

a) 164



$2^2 \cdot 41$

b) 205

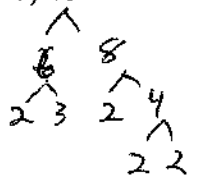


$5 \cdot 41$

c) 121

11^2

d) 48



$2^4 \cdot 3$

6) Factor the following polynomials completely.

a) $4x^3y - 4x^2y - 8xy$

$4xy(x^2 - x - 2)$

$4xy(x-2)(x+1)$

b) $2x(25x^6 - 36)$

$2x(5x^3-6)(5x^3+6)$

7) Factor the following polynomials completely.

a) $x^{12} - 16$

$(x^6-4)(x^6+4)$

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

b) $25x^2 + 20x + 4$

$(5x+2)^2$

8) Factor the following polynomials completely.

a) $6x^2 - 29x - 5$

$(x-5)(6x+1)$

30
-29
-30, 1

	x	-5
6x	$6x^2$	-30x
1	1x	-5

b) $-3x^2 - x + 2$

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

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

-6
1
3, -2. 3x

	x	1
3x	$3x^2$	3x
-2	-2x	+2

9) The area of a rectangle is $(3x^2 - 4x - 15)in^2$.

a) What are the width and length of the rectangle in terms of x?

b) What is the expression of the perimeter?

a) $L = 3x+5$

$w = x-3$.

b) $8x + 4$

	x	-3
3x	$3x^2$	-9x
5	5x	-15

-45
-4
-9, 5

$x-3+3x+5+x-3+3x+5$

Name: Key 3/30/2017 Algebra II – Test 6

1) Solve the following quadratics by factoring.

a) $2x^2 - 3x + 1 = 0$

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

$x=\frac{1}{2}, 1$

3 −3

	$2x$	-1
x	$2x^2$	-1
-1	$-2x$	1

$2x-1-1-2x$

b) $x^2 - 13x + 22 = 0$

$(x-11)(x-2)=0$

$x=11, 2.$

22 −13 −11 −2

6

2) You have used all five ways of solving a quadratic equation. Name all five of the ways **AND** state what they are useful for. (OR, when would you chose to use one over another?)

(5)

1) Graphing → primative
2) factoring → easiest.
3) Square root. → fastest
4) Completing the square → circles & vertex form
5) Quad. formula. → silver bullet

3) The $f(x)$ function can model the distance a projectile is from the ground where f is measure in feet and x is in seconds. $f(x) = -16x^2 + 45x + 200$.

a) What does a_0 being negative mean? (Why is it negative?) gravity pulling it down.

b) What does v_0 being positive mean? (Why is it positive?) shot up.

(6)

c) What is the velocity of the projectile? 45 ft/sec.

d) What height is the projectile launched from? 200 ft.

e) How long after being launched until the projectile hits the ground? 5.2 sec

$\frac{-45-121.6}{-32}$

14 825.

$\frac{-45 \pm \sqrt{45^2 - 4(-16)(200)}}{2(-16)}$

4) Use the discriminant to determine how many and what kind of solutions you would get for the following.

(3)

100 − 4 · 25 = 0

a) $x^2 - 10x + 25 = 0$

4 − 4(−2)(−3) = 4 − 24

b) $2x = 3 + 2x^2$

16 − 4(1)(3) = 16 − 12 = 4

c) $3 + x^2 = -4x$ +4x

Discriminant	Number/type of solutions
0	1 Real soln.
−20	2 imaginary.
4	2 Real soln.

5) Using $ax^2 + bx + c = 0$, then

(2)

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

6) Solve the following quadratics using square roots.

(8)

a) $x^2 = 36$ $x = \pm 6$

b) $x^2 - 196 = 0$ $x = \pm 14$

c) $x^2 + 49 = 0$ ✗ 2 imaginary

d) $x^2 + 4 = 24$

$\sqrt{x^2} = \sqrt{20}$

$x = \pm 2\sqrt{5}$

7) For each of the following quadratics, find the vertex, the axis of symmetry, the y-intercept, the zeros, the domain and range, how it opens.

Functions	Graph opens	Axis of symmetry	Vertex	Zeros	Domain and Range	y-intercept
a) $y = x^2 - 10x + 9$	up	$\frac{10}{2} = 5$ $x=5$	$(5, -16)$	$(+9,0)$ $(+1,0)$	D: $(-\infty, \infty)$ R: $[-16, \infty)$	$(0, 9)$.

(6)

8) Use the information provided to write the standard form of a circle AND identify the center and radius.

a) $8x + x^2 - 12y - 30 + y^2 = 21$

(6)

$x^2 + 8x + \underline{16} + y^2 - 12y \overset{+36}{} = 51 + \underline{16} + \underline{36}$

$(x+4)^2 + (y-6)^2 = 103.$

$C(-4, 6) \quad r = \sqrt{103}$

b) Center: $(-5, 1)$; Radius: 10

$(x+5)^2 + (y-1)^2 = 100.$

9) Our schools revenue can be modeled by the equation $C(t) = 0.75t^2 + 10t + 200$. Where t represents the number of students here. The weekly cost of running our school is modeled by: $C(t) = 80t + 700$. How many students must our school have to break even (when revenue equals the costs)?

(4) (3)

$.75t^2 + 10t + 200 = 80t + 700.$

$.75t^2 - 70t - 500 = 0.$

$\frac{70 \pm \sqrt{70^2 - 4(.75)(500)}}{2(.75)}$ (6400)

$\frac{70+80}{1.5} =$ 100 students

10) Solve the following quadratics using any method. Leave your answers in the simplest radical form.

a) $x^2 + 2x + 9 = 0$

(12)

2 imaginary $\quad x = \frac{-2 \pm \sqrt{4 - 4(1)(9)}}{2}$ $(4-36)$

b) $3x^2 - 11x - 4 = 0$

$\frac{11 \pm \sqrt{121 - 4(3)(-4)}}{6}$ (169)

$\frac{11 \pm 13}{6} = \frac{24}{6}, \frac{-2}{6}$

$= 4, -\frac{1}{3}$

c) $x^2 - 20 = 0$

$x^2 = 20$

$x = \pm 2\sqrt{5}$

d) $2x = 3 + 2x^2$

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

$\frac{2 \pm \sqrt{4 - 4(2)(3)}}{2(2)}$

2 ~~real~~ imaginary.

Name: 4/28/2017 Algebra II – Test 7

1) Multiply the following complex numbers.

a) $(1 + 2i)(3i - 5)$

$3i - 5 + 6i^2 - 10i = \boxed{-11 - 7i}$

b) $3i^{85}(4i + 6)$

$3i(4i + 6)$

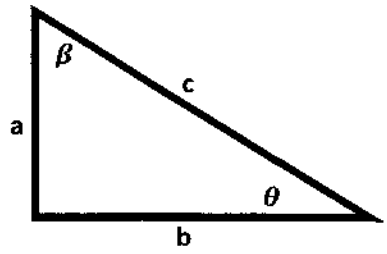
$12i^2 + 18i$

$\boxed{-12 + 18i}$

2)

Using the triangle on the right and the values given, find all the missing sides and angles. in the following chart.

$\sin(60) = \frac{8}{c}$



Given:	θ	β	a	b	c
a)	60°	30°	8	4.6	9.2
b)	70°	20°	~~10.7~~ 11	4	11.7
c)	30°	60°	10	17.3	20

$\sin(30) = \frac{4}{c}$

$\sin 30 = \frac{10}{c}$

3) What are the definitions of the following trigonometric functions

$\sin(\theta) =$ opp/hyp

$\cos(\theta) =$ adj/hyp

$\tan(\theta) =$ opp/adj

$\csc(\theta) =$ hyp/opp

$\sec(\theta) =$ hyp/adj

$\cot(\theta) =$ adj/opp

4) Each of the trig functions given above are abbreviations. What do each of the abbreviations stand for?

Sine, Cosine, tangent, Cosecant, Secant, Cotangent.

5) Solve the following quadratics.

a) $x^2 - 2x + 10 = 0$

$\frac{2 \pm \sqrt{4 - 4 \cdot 10 \cdot 1}}{2}$ (-36)

$\frac{2 \pm 6i}{2} = \boxed{1 \pm 3i}$

b) $5x^2 + 8x + 4 = 0$

$\frac{-8 \pm \sqrt{64 - 4 \cdot 4 \cdot 5}}{10}$ ($64 - 80 = -16$)

$\frac{-8 \pm 4i}{10} = \boxed{\frac{-4}{5} \pm \frac{2}{5}i}$

6) Simplify and write your answer in the form $a + bi$.

a) $i^{49} - i^{21}$

$i - i = 0$

b) $i^{12} - i^{35}$

$1 - -i = \boxed{1 + i}$

7) State the conjugate of each of the following complex numbers.

a) $-5i + 21$

$\boxed{21 + 5i}$

b) $5 + 4i$

$\boxed{5 - 4i}$

8) Solve the following quadratics using square roots.

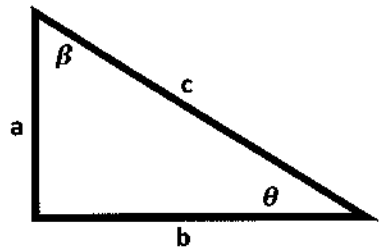
a) $x^2 = -64$ $x = \pm 8i$

b) $x^2 + 196 = 0$ $x = \pm 14i$

c) $x^2 + 9 = 0$ $x = \pm 3i$

9)

Using the triangle on the right and the values given, find all the missing sides and angles. in the following chart.

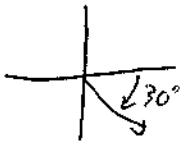


Given:	θ	β	a	b	c
a)	53.1°	36.9°	4	3	5
b)	36.9°	53.1°	6	8	10

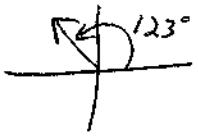
10) Draw the following angles. Then find their reference angles.

a) -30°

R.A. 30

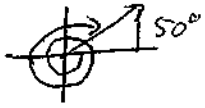


b) 123°



R.A: 57°

c) -670°



R.A: 50°

d) 225°

R.A: 45°

11) Find each angle and all co-terminal angles.

a) $\sin(\theta) = .25$

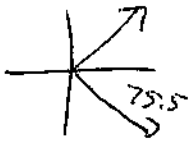
$\theta = 14.5^\circ + 360n$

$165.5^\circ + 360n$

b) $\cos(\theta) = .25$

$\theta = 75.5^\circ + 360n$

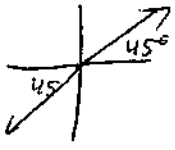
$284.5^\circ + 360n$



c) $\tan(\theta) = 1$

$\theta = 45^\circ + 360n$

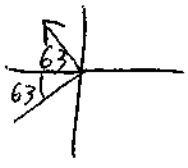
$225^\circ + 360n$



d) $\cos(\theta) = -.454$

$\theta = 117^\circ + 360n$

$243^\circ + 360n$



Name: Key

1/13/2017

Algebra II Quiz ~~13~~ 14

1) What are m and b in the slope-intercept form of a line?

↳ slope ↳ ~~inter~~ y-inter.

2) Given the following information, find the equation of the line in slope-intercept form.

a) Slope: -3, y-intercept: 4

$y = -3x + 4$

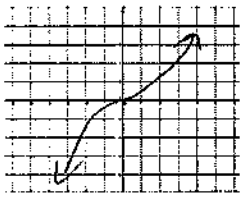
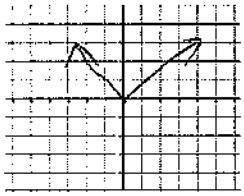
b) Slope: 2, Passes through: (2, 1)

$1 = 2(2) + b$

$b = -3$

$y = 2x - 3$.

3) Fill in the missing information.

Function Notation	Name	Graph
$f(x) = x^3$	Cubic	
$f(x) = \|x\|$	Absolute Value	

4)

D $f(x) \to f(x+3)$

E $f(x) \to f(x)+3$

A $f(x) \to -f(x)$

A) Reflection across x-axis
B) Reflection across y-axis
C) Right 3
D) Left 3
E) Up 3
F) Down 3

5) Match the following forms with their definitions

C W-2
A W-4
D 1040
B ND-1

A. form used by employees to inform employers of exemptions
B. form used to report income to the state
C. form used by employers to report income paid to an employee
D. form used to report income to the IRS

6) What does IRS stand for?

Internal revenue service.

Name: key
1/20/2017
Algebra II Quiz 1.4/1.5

1) Given the following information, find the equation of the line in slope-intercept form.

a) Slope: -3, y-intercept: 4

$y = -3x + 4$

b) Slope: 2, Passes through: (2, 1)

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

$y = 2x - 3$

2) Match the following general transformations with their descriptions.

D $f(x) \to f(x+3)$
~~5~~ H $f(x) \to f(3x)$
G $f(x) \to 3f(x)$
E $f(x) \to f(x)+3$
A $f(x) \to -f(x)$
B $f(x) \to f(-x)$

A) Reflection across x-axis
B) Reflection across y-axis
C) Right 3
D) Left 3
E) Up 3
F) Down 3
G) Vertical Stretch by 3
H) Vertical Compression by $\frac{1}{3}$
I) Horizontal Stretch by 3
J) Horizontal Compression by $\frac{1}{3}$

3) Given the following lines perform the following **consecutive** transformations. Simplify each time.

$f(x) = x + 2 \to f(x+2) \to f(x) - 1 \to 3f(x) \to -f(x)$

a) $(x+2)+2$
$x+4$

b) $x+3$

c) $3(x+3)$
$3x+9$

d) $-3x-9$

4) Graph the following lines and their transformations on the same graph.

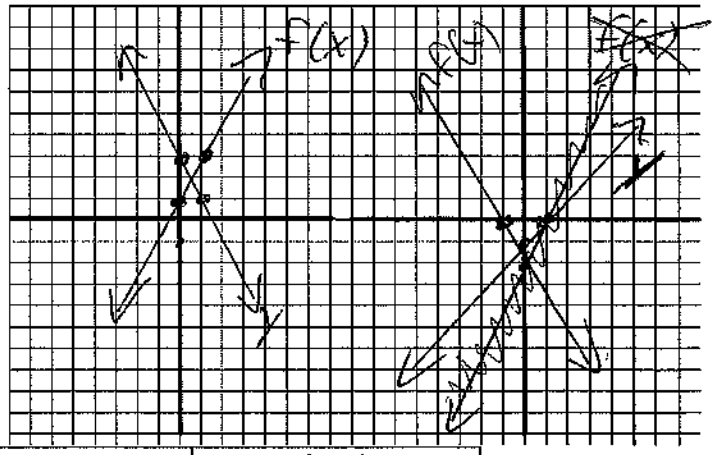
a) $y = -2x + 3$

-Down 4, Reflect across x-axis $2x+1 = f(x)$

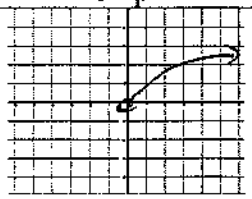
b) $y = x - 1$

-Reflect y-axis, Vertical Stretch by 2

$f(x)$ $-x-1$ ~~$2(-x)+3 \to -2x+3$~~
$-2x-2$ ~~$-4x+6$~~



5) Fill in the missing information.

Function Notation	Name	Graph
$f(x) = \sqrt{x}$	Square Root	

Name: Key
1/27/2017
Algebra II Quiz 16

1) Given the following functions: I) Identify the parent function and II) Describe the transformations done to the parent function.

a) $f(x) = (x-2)^2+3$
I) quadratic
II) right 2
up 3

b) $f(x) = -|x+4|$
I) absolute value
II) reflect across x-axis, left 4.

2) Write the prime factorization of each number.

a) 18 $2 \cdot 3^2$

b) 150 $2 \cdot 3 \cdot 5^2$.

3) Find the GCF of each pair of numbers.

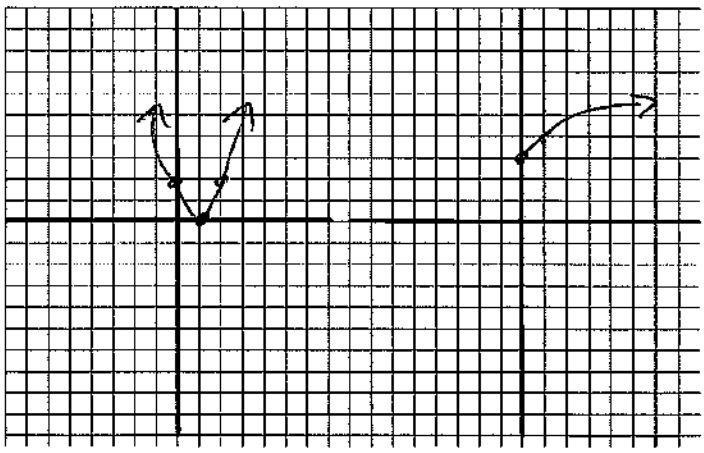
a) $8x^2, 110$ 2

b) $-64x^4, 24x^2$ $8x^2$

4) What does it mean to factor something?

write as a product.

5) Graph the following functions.
a) $f(x) = 2(x-1)^2$
b) $f(x) = \sqrt{x} + 3$



Name: key

2/9/2017

Algebra II Quiz 17

1) Factor the following polynomials.

a) $x^2 + 16x + 28$ $(x+2)(x+14)$

b) $x^2 + 3x - 10$ $(x+5)(x-2)$

2) Factor each polynomial.

a) $-15x - 10x^2$ $-5x(2x+3)$

b) $33x^3 + 22x^2 + 11x$ $11x(3x^2+2x+1)$

3) Factor each polynomial by grouping.

a) $(x^3 + 3x^2) + (5x + 15)$ $x^2(x+3) + 5(x+3)$ $(x+3)(x^2+5)$

b) $(2x^3 - x^2) + (-3 + 6x)$ $x^2(2x-1) + 3(2x-1) = (2x-1)(x^2+3)$

4) Sect 7.3 HW. Factor the following polynomials.

a) $x^2 + 12x + 11$ $(x+11)(x+1)$

b) $x^2 - 10x - 24$ $(x-12)(x+2)$

5) Sect 7.4 HW. Factor the following polynomials.

a) $6x^2 + 11x + 4$

	$2x$	1
$3x$	$6x^2$	$3x$
4	$8x$	4

$(2x+1)(3x+4)$

24
11

1, 24
2, 12
3, 8

b) $-3x^2 + 16x - 16$

$-(3x^2 - 16x + 16)$

	$3x$	-4
x	$3x^2$	$-4x$
-4	$-12x$	16

$(3x-4)(x-4)$

48
-16

-3, 16
-6, 8
-12, -4

Name: Key 2/17/2017 Algebra II Quiz 18

1) Fill in the blanks for the steps to factor things completely

a) GCF
-Watching to make sure the first term is positive

b) Grouping
-if more than 4 terms.

c) □ ◇
-if a trinomial

d) Binomial
-Check for diff of 2 □ (special case)

2) Sect 7.5 HW Factor the following polynomials.

a) $25y^2 - 16x^2$ $(5y-4x)(5y+4x)$

b) $4x^2 - 4x + 1$ $(2x-1)^2$

3) Sect 7.6 HW Factor each polynomial.

a) $4x^6 - 30x^5 + 36x^4$ $2x^4(2x^2-15x+18)$ $2x^4(2x-3)(x-6)$

b) $xy^4 - 16x$ $x(y^4-16)$ $x(y^2-4)(y^2+4)$ $x(y-2)(y+2)(y^2+4)$

4) Sect 7.6 HW. Factor the following polynomials completely

a) $12(x+1)^2 + 60(x+1) + 75$

b) $45x(x-2)^2 + 60x(x-2) + 20x$

5) The area of a rectangle is $(3x^2 - 4x - 15)in^2$. What are the width and length of the rectangle in terms of x?

$w = (x-3)$
$l = 3x+5$

	x	-3
$3x$	$3x^2$	$-9x$
5	$+5x$	-15

-45
-4

36
-15

9 4
-3 -12

	x	-6
$2x$	$2x^2$	$+12x$
-3	$-3x$	18

4a) $3(4y^2+20y+25)$

$3(2y+5)^2$

$3(2(x+1)+5)^2$

$3(2x+7)^2$

4b) $5x(9y^2+12y+4)$

$5x(3y+2)^2$

$5x(3(x-2)+2)^2$

$5x(3x-4)^2$

Name: Key 3/3/2017 Algebra II Quiz 19

1) Order the following functions from widest to narrowest.

$f(x) = \frac{1}{2}x^2 + 3$ $h(x) = -\frac{1}{8}x^2$ $g(x) = 8x^2 - 2$ $R(x) = -2x^2$ $Q(x) = x^2$

$h(x), f(x), Q(x), R(x), g(x)$

2) A basic formula used to model a projectile's height is given as: $h = \frac{1}{2}a_0t^2 + v_0t + h_0$. What do each of the coefficients/constant represent?

a_0 initial acceleration v_0 initial velocity h_0 initial height.

b) How would you say "v_0"

V not.

3) A fireworks shell is fired from a mortar. The function models its height:
$f(x) = -16x^2 - 224x$, where x is the time in seconds and f is the height in feet.
Using a graphing device:
a) The shell is supposed to explode at its maximum height. What height should it explode at? 784 ft.
b) If the shell is a dud, how long will it take to return to the ground? 14 sec.

(12) 4) For each of the following quadratics, find the vertex, the axis of symmetry, the y-intercept, the zeros, the domain and range, how it opens.

Functions	Graph opens	Axis of symmetry	Vertex	Zeros	Domain and Range	y-intercept
a) $y = x^2 - 10x + 9$	up	$x=5$	$(5,-16)$	$(9,0)$ $(1,0)$	D: $(-\infty,\infty)$ R: $[-16,\infty)$	$(0,9)$
b) $y = -x^2 + 6x - 8$	down	$x=3$.	$(3,1)$	$(4,0)$ $(2,0)$	D: $(-\infty,\infty)$ R: $(-\infty,1]$	$(0,-8)$.
	(1)	(2)	(2)	(2)	(2)	(2)

$x = \frac{10}{2}$ $25-50+9$ -16

$x = \frac{-6}{-2} = 3$ $-9+18-8$

Name: key 3/10/2017 Algebra II Quiz 20

1) Solve the following quadratics by factoring.

a) $2x^2 - 3x + 1 = 0$ $(2x-1)(x-1)=0$ $x=\frac{1}{2}, 1$

b) $x^2 + 8x + 15 = 0$ $(x+3)(x+5)=0$ $x=-3,-5$.

2) A basic formula used to model a projectile's height is given as: $h = \frac{1}{2}a_0t^2 + v_0t + h_0$. What do each of the coefficients/constant represent?

a_0 initial acceleration v_0 initial velocity h_0 initial height.

b) How would you say "h_0"

"h not"

3) The $f(x)$ function can model the distance a projectile is from the ground where f is measure in feet and x is in seconds. $f(x) = -16x^2 + 45x + 200$.

a) What does a_0 being negative mean? (Why is it negative?) going down

b) What does v_0 being positive mean? (Why is it positive?) shot up.

c) What is the initial velocity of the projectile? 45 ft/sec

d) What height is the projectile launched from? 200 ft.

e) How long after being launched until the projectile hits the ground? 5.2 sec.

4) For each of the following quadratics, find the vertex, the axis of symmetry, the y-intercept, the zeros, the domain and range, how it opens.

Functions	Graph opens	Axis of symmetry	Vertex	Min/ max	Zeros	Domain and Range	y-intercept
a) $y = -x^2 + 4x - 4$	down	$x=2$	$(2,0)$	max	$(2,0)$	D: $(-\infty,\infty)$ R: $(-\infty, 0]$	$(0,-4)$
b) $y = x^2 - 4x - 12$	up	$x=2$	$(2,-16)$	min	$(6,0)$ $(-2,0)$	D: $(-\infty,\infty)$ R: $[-16,\infty)$	$(0,-12)$

$(x-6)(x+2)$

$-4+8-4$

$4-8-12$

Name: Key 3/16/2017 Algebra II Quiz 21

1) 2) Solve the following quadratics using square roots.

a) $\sqrt{x^2} = \sqrt{169}$ $x = \pm 13$

b) $x^2 - 625 = 0$ $+625$ $\sqrt{x^2} = \sqrt{625}$ $x = \pm 25$

c) $x^2 + 25 = 0$ 2 imaginary.

2) Solve the following quadratic by completing the square.

$x^2 + 6x = 16$

$x^2 + 6x + 9 = 16 + 9$

$(x+3)^2 = 25$

$x+3 = \pm 5$

$x = -3 \pm 5$

$x = 2, -8$

3) The height of a rocket in meters is approximated by $h = -5t^2 + 60t$, where h is the height in meters and t is the time in seconds.

a) How long after being launched until the rocket hits the ground? 12 sec. $0 = -5t^2 + 60t$ $= -5t(t-12)$ $t = 0, 12$.

b) How fast is the rocket travelling? *Be careful of your units 60 m/s

c) What is the highest it will reach? $-5(6)^2 + 60(6) =$ 180m

d) How long until it reaches its highest point? 6 sec

4) Solve each quadratic by factoring.

a) $x^2 - 2x - 8 = 0$

$(x-4)(x+2) = 0$

$x = 4, -2$.

b) $4x^2 - 9x = -2$

$+2 \quad +2$

$4x^2 - 9x + 2 = 0$

$(4x-1)(x-2) = 0$

$x = 2, \frac{1}{4}$

8, -9; $-1, -8$

	x	-2
$4x$	$4x^2$	$-8x$
-1	$-1x$	2

Name: Key 3/24/2017 Algebra II Quiz 22

1) Solve the following equations using the quadratic formula. Leave your answers in simplest radical form. (not decimal!)

a) $x^2 = 2x + 9$

$x^2 - 2x - 9 = 0$

$a = 1$, $b = -2$, $c = -9$

$\frac{2 \pm \sqrt{4 - 4(1)(-9)}}{2}$ $\quad 40$

$1 \pm \sqrt{10}$

b) $0 = 2x^2 - x - 21$

$a = 2$, $b = -1$, $c = -21$

$\frac{1 \pm \sqrt{1 - 4(2)(-21)}}{4}$ $\quad 169$

$\frac{1 \pm 13}{4} = \frac{14}{4}, \frac{-12}{4}$

$\frac{7}{2}, -3$

2) Use the discriminant to determine how many and what kind of solutions you would get for the following.

a) $-3x^2 - 2x = 1$ $\quad +1 \quad +1$

$a = -3$, $b = -2$, $c = -1$

$4 - 4(-3)(-1)$

$-8 \Rightarrow$ 2 imaginary

b) $\frac{1}{2}x^2 + x - 3 = 0$

$1 - 4(\frac{1}{2})(-3)$

$7 \Rightarrow$ 2 reals

c) $8x + x^2 = -16$ $\quad +16 \quad +16$

$64 - 4(1)(16)$

$0 \Rightarrow$ 1 Real

3) You have used all five ways of solving a quadratic equation. Name all five of the ways **AND** state what they are useful for. (OR, when would you chose to use one over another?)

1) Graphing → primative

2) factoring → fastest.

3) $\sqrt{\ }$ → easiest.

4) Completing the square → vertex form & circles

5) quadratic formula → silver bullet.

4) Use the information provided to write the standard form of a circle AND identify the center and radius.

a) $6x + x^2 - 10y = 30 - y^2$ $\quad +y^2$

$x^2 + 6x + \underline{9} + y^2 - 10y + \underline{25} = 30 + \underline{9} + \underline{25}$

$(x+3)^2 + (y-5)^2 = 64$

C(-3,5) r=8

b) $x^2 + y^2 - 22x + 18y + 102 = 0$ $\quad +81 \quad +121$

$x^2 - 22x + \underline{121} + y^2 + 18y + \underline{81} = -102$

$(x-11)^2 + (y+9)^2 = 100$

C(11,-9) r=10

5) Use the information provided to write the standard form of a circle AND identify the center and radius.

a) Center: $(13, -2)$; Diameter: 16

$r = 8$

$(x-13)^2 + (y+2)^2 = 64$

b) $(x+3)^2 + (y-2)^2 = 20$

Translated 3 units right and 7 units down

$(-3, 2) \rightarrow (0, -5)$

$(x-0)^2 + (y+5)^2 = 20$

6) Put the following equations in vertex form and identify the vertex.

a) $y = x^2 + 12x - 17$

$x^2 + 12x + \underline{36} - 17 - \underline{36}$

$y = (x+6)^2 - 53$

V(-6,-53)

b) $y = x^2 + 14x$

$y = x^2 + 14x + 49 - 49$

$y = (x+7)^2 - 49$

V(-7,-49)

Name: key 4/7/2017 Algebra II Quiz 24

1) Solve the following quadratics using square roots.

a) $x^2 = -169$ $x = \pm 13i$

b) $x^2 + 625 = 0$ $x = \pm 25i$

c) $x^2 + 25 = 0$ $x = \pm 5i$

2) Find the values of x and y that make each equation true.

a) $5(x-1) + 3yi = -15i - 20$

$3y = -15$, $y = -5$

$5(x-1) = -20$, $x - 1 = -4$, $x = -3$

b) $x + 3xi = 4 + yi$

$x = 4$

$3x = y$, $3(4) = y$, $12 = y$

3) State the conjugate of each of the following complex numbers.

a) $-2.5i + 1$ $1 + 2.5i$

b) $\frac{i}{10} - 6$ $-6 - \frac{i}{10}$

4) Solve the following quadratics using square roots.

a) $x^2 - 10x + 26 = 0$

$$\frac{10 \pm \sqrt{100 - 4(26)(1)}}{2} \quad (-4)$$

$$\frac{10 \pm 2i}{2} = 5 \pm i$$

b) $x^2 - 10x + 37 = 0$

$$\frac{10 \pm \sqrt{100 - 4(37)(1)}}{2} \quad (-148)$$

$$\frac{10 \pm 4i\sqrt{3}}{2} = 5 \pm 2i\sqrt{3}$$

Name: Key 4/13/2017 Algebra II Quiz 25

1) Multiply the following complex numbers.

a) $(2-i)(3-4i)$

$6-8i-3i+4i^2$, $i^2=-1$

-4

$2-11i$

b) $2i^{70}(8i-9)$

$i^{70}=-1$

$-2(8i-9)$

$18-16i$

2) Find the values of x and y that make each equation true.

a) $5(x+3)+5yi=-15i-20$

$5y=-15$ $\quad 5(x+3)=-20$

$y=-3$ $\quad x+3=-4$

$x=-7$

b) $x+5xi=2+yi$

$5x=y$ $\quad x=2$

$y=10$

3) State the conjugate of each of the following complex numbers.

a) $5i-21$

$-21-5i$

b) $5-4i$

$5+4i$

4) Solve the following quadratics.

a) $x^2-10x+30=0$

$\frac{10\pm\sqrt{100-4(1)(30)}}{2}$ $\quad 100-120=-20$

$\frac{10\pm 2i\sqrt{5}}{2}\rightarrow 5\pm i\sqrt{5}$

b) $2x^2+6x+9=0$

$\frac{-6\pm\sqrt{36-4(2)(9)}}{4}$ $\quad 36-72$

$\frac{-6\pm 6i}{4}=-\frac{3}{2}\pm\frac{3}{2}i$

5) Simplify and write your answer in the form $a+bi$.

a) $i^{52}-i^{48}$

$4\overline{)52}$ $\quad 13$

$1-1=0$

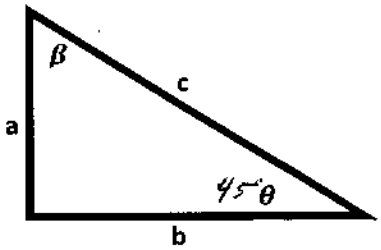
b) $i^{46}-i^{43}$, $i^{46}=-1$, $-i^{43}=-i$

$-1+i$

Name: Key 4/21/2017 Algebra II Quiz 26

1)

Using the triangle on the right and the values given, find all the missing sides and angles. in the following chart.



Given:	θ	β	a	b	c
a)	45°	45°	7	7	$7\sqrt{2}$ or 9.9
b)	75°	15°	11.2	3	11.6
c)	30°	60°	5	$5\sqrt{3}$ or 8.7	10

2) What are the definitions of the following trigonometric functions

$\sin(\theta) = \frac{opp}{hyp}$

$\cos(\theta) = \frac{adj}{hyp}$

$\tan(\theta) = \frac{opp}{adj}$

$\csc(\theta) = \frac{hyp}{opp}$

$\sec(\theta) = \frac{hyp}{adj}$

$\cot(\theta) = \frac{adj}{opp}$

3) Each of the trig functions given above are abbreviations. What do each of the abbreviations stand for?

Sine, Cosine, tangent, Cosecant, Secant, co tangent.

4)

a) Who sines legislation? Congress

b) Who cosines legislation? president

c) Who tans too much?

Congress & president.