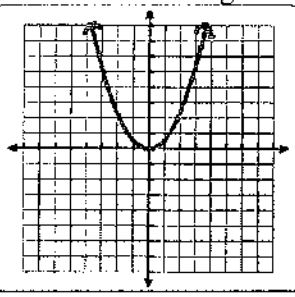
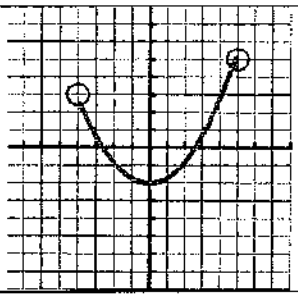
Name: Key 12/14/2017 Algebra II – Semester Test

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

(4)

a)  D: $(-\infty,\infty)$ R: $[0,\infty)$

b)  D: $(-4,5)$ R: $[-2,5)$

2) Find the equivalent sets for the following:

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

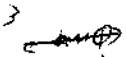
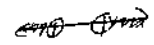
3) Simplify the following expressions. Leave your answers in exponent form with positive exponents.

(6) 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) Given the sets, state the following. $U = \{1,2,3,5,7,11,13,17,19\}$, $A = \{1,2,3,17\}$, and $B = \{1,2,3,5,7,11\}$

(4) a) B' $\{13,17,19\}$ | b) $A \cup B$ $\{1,2,3,5,7,11,17\}$

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

(6) a) $5 \le 4b - 3 < 9$ $2 \le b < 3$ $[2,3)$  | b) $x + 2 < -2$ OR $x - 2 > 2$ $x < -4$ or $x > 4$ 

6) Simplify each polynomial expression.

(4) a) $3x^3 - 18x^4 + 5 + 7x^3 - 4x^2 - 9x^4$ $-27x^4 + 10x^3 - 4x^2 + 5$ | b) $(-x^2 + x^2y - y^2) + (+2y^2 + x^2 + xy^2)$ $-2x^2 + y^2 + x^2y - xy^2$

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

(2) a) $x^3 + 3x$ cubic binomial | b) 2^4 constant monomial

8) Factor the following polynomials.

(6) a) $x^2 + 16x + 28$ $(x+14)(x+2)$ | b) $x^2 + 3x - 10$ $(x+5)(x-2)$

9) Rationalize/simplify the following radicals.

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

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

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

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

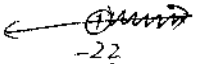
(6) a) $-2(7x + 15) < 14$

$-14x - 30 < 14$

$+30 \quad +30$

$\frac{-14x}{-14} < \frac{44}{-14}$

$x > -\frac{22}{7}$



$(-\frac{22}{7}, \infty)$

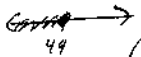
b) $-2x + 9 - 10 \ge 3(9x + 16)$

$-2x - 1 \ge 27x + 48$

$-27x + 1 \quad -27x + 1$

$\frac{-29x}{-29} \ge \frac{49}{-29}$

$x \le \frac{49}{-29}$



$(-\infty, \frac{49}{-29}]$

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) $-(6x+6)-5>1-6x$ $-6x-6-5>1-6x$ $-11>1$ no soln

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

13) Simplify the following radicals.

(6)

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

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

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.

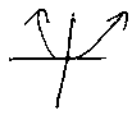
(6)

a) $(2x+4)(x^2-7x+3)$ $2x^3-10x^2-22x+12$.

b) $(x-3)^2$ x^2-6x+9

16) Fill in the missing information.

(2)

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

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

(4)

a) $6-\frac{x}{3}>4$ 6 minus x divided by 3 is greater than 4

b) $7-x\le 8$ 7 minus x is less than or equal to 8.

18) a) With radicals, we do not want a $\sqrt{\ }$ in the 1, and we do not want a 1 in the $\sqrt{\ }$.

(6)

b) In the radical $\sqrt[4]{\ }$, 4 is the index. We say it is a 4 for 1 deal.

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

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

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. $10+3.99x$

b) How much do I get charged for renting 5 movies in one month? $10+3.99(5)=\$29.95$

20) Factor the following polynomials completely.

(6)

a) $10x^2-17x+7$ $(10x-7)(x-1)$

	$10x$	-7
x	$10x^2$	$-7x$
-1	$-10x$	7

$1\cdot 70$ -17
$2\cdot 35$
$5\cdot 14$
$-7-10$

b) $6x^2+11x+4$ $(2x+1)(3x+4)$

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

$1\cdot 24$ 11
$2\cdot 12$
$3\cdot 8$

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

Name: 2/6/2018 Algebra II – Test 4

1) Solve the following quadratics by factoring.

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

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

$x = 1/2, 1$

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

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

$x = 11, 2$

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

2) 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?) start up.

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? $x = 5.2$ sec

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

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

	Discriminant	Number/type of solutions
a) $x^2 - 10x + 25 = 0$	$10^2 - 4\cdot25 = 0$	1 Real.
b) $2x = 3 + 2x^2$ $-2x \quad -2x$	$2^2 - 4\cdot2\cdot3 =$ $4 - 24 \quad -20$	2 imag.
c) $3 + x^2 = -4x$ $+4x \quad +4x$	~~4~~ $4^2 - 4\cdot1\cdot3 = 4$ $16 - 12$	2 Real.

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

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

5) Solve the following quadratics using square roots.

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

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

c) $x^2 + 49 = 0$ 2 imaginary or $\pm 7i$

d) $x^2 + 4 = 24$

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

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

6) 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: $[-16, \infty)$	$(0,9)$

$\frac{16}{-2}$

7) Our school's 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)?

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

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

$\frac{70 \pm \sqrt{70^2 - 4 \cdot (.75)(-500)}}{2(.75)}$ = 100 stud.

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

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

2 imag.

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

c) $x^2 + 6x + 3 = 0$

d) $2x^2 + 3x = 9$

$-9 \quad -9$

a) $\frac{-2 \pm \sqrt{2^2 - 4 \cdot 1 \cdot 9}}{2}$ $4 - 36 = -32$ $= 4i\sqrt{2}$

$-1 \pm 2i\sqrt{2}$

b) $\frac{11 \pm \sqrt{11^2 - 4 \cdot (3)(-4)}}{2(3)}$ $121 + 48 = 169$

$\frac{11 \pm 13}{6}$

$\frac{24}{6} \quad -\frac{2}{6}$

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

c) $\frac{-6 \pm \sqrt{6^2 - 4 \cdot 3 \cdot 1}}{2}$ $36 - 12 = 24$

$\frac{-6 \pm 2\sqrt{6}}{2} = -3 \pm \sqrt{6}$

d) $\frac{-3 \pm \sqrt{3^2 - 4 \cdot 2 \cdot (-9)}}{2(2)}$ $9 + 72 = 81$

$\frac{-3 \pm 9}{4} = \frac{6}{4}, \frac{-12}{4}$

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

Name: Key 3/13/2018 Algebra II – Test 5

1) Solve the following equations. Leave your answer in the simplest radical form.

a) $x^2 + 25 = 0$

$-25 \quad -25$

$\sqrt{x^2} = \sqrt{-25}$

$x = \pm 5i$

b) $-149 = x^2 - 24x + 149$

$+149$

$24 \pm \sqrt{576 - 596}$ ($576 - 596 = -20$)

$24 \pm \sqrt{576 - 4 \cdot 149}$

$\frac{24 \pm 2i\sqrt{5}}{2} = \frac{2}{12 \pm i\sqrt{5}}$

(12)

c) $x^2 + 18 = -6x$

$+6x \quad +6x$

$x^2 + 6x + 18$

$\frac{-6 \pm \sqrt{36 - 72}}{2}$ ($36 - 72 = -36$)

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

d) $0 = 3x^2 + 4x + 3$

$\frac{-4 \pm \sqrt{16 - 4 \cdot 3 \cdot 3}}{2 \cdot 3}$ ($16 - 36 = -20$)

$\frac{-4 \pm 2i\sqrt{5}}{6} = \frac{-2 \pm i\sqrt{5}}{3}$

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

a) $2xi + 1 = -x + 6 - yi$

$-y = 2x$

$i = -x + 6$

$x = 5 \Rightarrow y = -10$

b) $x + 4i = y + yi$

$x = y$

$x = 4$

$y = 4$?

(4)

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

a) $-i$

i

b) $2i - 6$

$-6 - 2i$

(3)

4) Multiply the following complex numbers.

a) $(5 + 6i)(2 + i)$

	5	6i
2	10	12i
i	5i	$6i^2$

$6i^2 = -6$

$4 + 17i$

b) $-i^{42}(-3i + 14)$

-1

$-14 + 3i$

c) $(7 + 5i)(7 - 5i)$

	7	5i
7	49	35i
-5i	-35i	$-25i^2$

$-25i^2 = 25$

74

d) $(1 + 2i)(2 - 1i)$

	1	2i
2	2	4i
-i	-i	$-2i^2$

$-2i^2 = 2$

$4 + 3i$

(12)

5) Add/subtract the following complex numbers.

a) $8 + 9i - 5(2 - 3i)$

$-10 + 15i$

$-2 + 24i$

b) $(6 + 4i) + (5 - 7i)$

$11 - 3i$

(4)

6) Find the absolute value of each complex numbers.

a) $|3 + 4i|$

$3^2 + 4^2 = c^2$

$c = 5$

b) $|5i|$

5

c) $|9 - 3i|$

$9^2 + 3^2 = 90$

$c = \sqrt{90}$

$= 3\sqrt{10}$

(6)

$-i$ R3 i

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

a) $2i^{51} - 3i^{41}$ ($-i$, i)

(12) $-2i - 3i = \boxed{-5i}$

b) $5i^{39} - 6i^{109}$ ($-i$, i)

$-5i - 6i = -11i$

c) $\frac{(2+5i)}{1-2i}\frac{(1+2i)}{(1+2i)} = \boxed{\frac{-8+9i}{5}}$

	2	$5i$
1	2	$5i$
$2i$	$4i$	$10i^2$

d) $\frac{(3+7i)}{3i} \cdot \frac{-3i}{-3i} = \frac{21-9i}{9} = \boxed{\frac{7-3i}{3}}$

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

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

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

(6) $y = (x+6)^2 - 19$ $\quad y = (-6, -19)$

b) $y = -x^2 + 14x$ (-49)

$-(x^2 - 14x + \underline{49}) - \underline{-49}$

$y = -(x-7)^2 + 49$ $\quad \boxed{V(7, 49)}$

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

(12) a) $6x + x^2 - 10y = 30 - y^2$ ($+y^2$)

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

$C(-3, 5)$ $\quad (x+3)^2 + (y-5)^2 = 64$

$r = 8$

b) $x^2 + y^2 - 22x + 18y + 102 = 0$

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

$\boxed{(x-11)^2 + (y+9)^2 = 100}$ $\quad C(11, -9)$ $\quad r = 10$

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

$\boxed{(x-13)^2 + (y+2)^2 = 64}$

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

Translated 3 units right and 7 units down

$C(-3, 2)$

$+3 \quad -7$

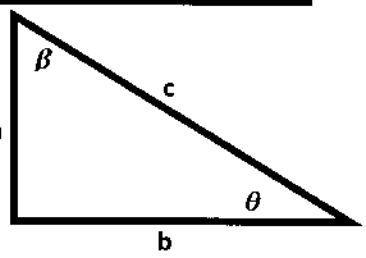
$C(0, -5)$ $\quad \boxed{(x-0)^2 + (y+5)^2 = 20}$

$r = 2\sqrt{5}$

6

Name: Key. 4/26/2018 Algebra II – Test 7

1)
Using the triangle on the right and the values given, find all the missing sides and angles. in the following chart.



(9) $\sin(55) = \frac{9}{7}$

3 $\tan(\theta) = \frac{a}{3}$ 13

$a = 17$

Given:	θ	β	a	b	c
a)	55°	35°	5,7	4,1	7
b)	80°	10°	17	3	17,3
c)	53°	37°	12	9	15

$17^2+3^2=c^2$

$\tan\theta = \frac{12}{9}$

$\theta = \tan^{-1}\left(\frac{12}{9}\right)$

2) What are the definitions of the following trigonometric functions

(3)

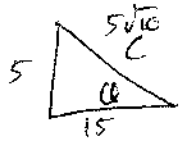
$\sin(\theta)$ = opp/hyp	$\cos(\theta)$ = adj/hyp	$\tan(\theta)$ = opp/adj
$\csc(\theta)$ = hyp/opp	$\sec(\theta)$ = hyp/adj	$\cot(\theta)$ = adj/opp

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

(3) Sine, cosine, tangent, secant, cosecant, cotangent

4) Using the triangle above and the values given, fill in the following chart.

(6)



$c^2 = 5^2+15^2$

$\sqrt{c^2} = \sqrt{250}$

$c = 5\sqrt{10}$

Trig Function	a) $a = 5, b = 15$
$\sin\theta$	$5/5\sqrt{10} = \sqrt{10}/10$
$\cos\theta$	$15/5\sqrt{10} = 3\sqrt{10}/10$
$\tan\theta$	$5/15 = 1/3$
$\csc\theta$	$\sqrt{10}$
$\sec\theta$	$\sqrt{10}/3$
$\cot\theta$	3

5) Draw the following vector: $< -4, 3 >$

(2)

6) Find the component form of the vector $\overrightarrow{AB}$

(2)

$A(-7,-12)$ & $B(4,-8)$

$-8-12 = 4$

$4-7 = 11$

$< 11, 4 >$

7) What is the magnitude of the each of the following vectors? Write your answer in the simplest radical form.

(4)

a) $< 12, 10 >$

$12^2 + 10^2 = c^2$

$c = 2\sqrt{61}$

b) $< -6, 8 >$

$6^2 + 8^2 = c^2$

$c = 10$

8) Find each vector sum.

(2)

a) $< 5, 10 > + < -11, 7 >$

$< -6, 17 >$

b) $< -1, 8 > + < -6, -3 >$

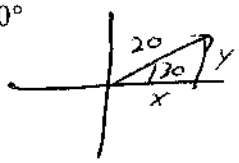
$< -7, 5 >$

9) Find a vector in component form for the following:

Magnitude 20 and direction 30°

(3)

$< 17.3, 10 >$

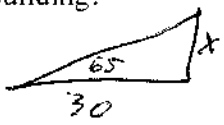


$20 \sin(30) = \frac{y}{20} \cdot 20$ $\quad y = 10$

$20 \cos(30) = \frac{x}{20} \cdot 20$ $\quad x = 17.3$

10) Ethan is standing 30ft away from a building. He measures the angle to the top of the building to be 65°. How tall is the building?

(3)



$30 \tan(65) = \frac{x}{30} \cdot 30$

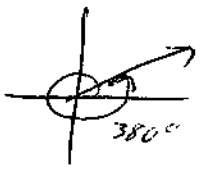
$x = 64.3 ft$

11) Graph the following angles.

(4)

a) $-160°$

b) 380°



12) For the following angles, find the reference angle.

(4)

a) $-160°$

$180 - 160 = 20°$

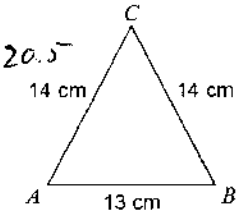
b) 380°

$380 - 360 = 20°$

13) Find the area of the following triangles.

(6)

a)

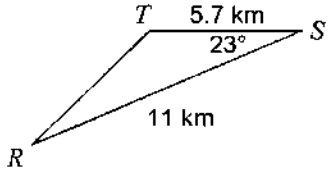


$s = \frac{14+14+13}{2} = 20.5$

$A = \sqrt{20.5(20.5-14)(20.5-13)(20.5-14)}$

$= 80.6 cm^2$

b)



$A = \frac{1}{2} a \cdot b \sin Q$

$= \frac{1}{2} \cdot 5.7 (11) \sin(23)$

$= 12.2 km^2$

Name: Key 1/12/2018 Algebra II – Quiz 13

1) Match the following forms with their definitions

C	W-2	A. form used by employees to inform employers of exemptions
A	W-4	B. form used to report income to the state
D	1040	C. form used by employers to report income paid to an employee
B	ND-1	D. form used to report income to the IRS

2) 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? 784ft.
b) If the shell is a dud, how long will it take to return to the ground? 14 sec.
c) What does a_0 being negative mean? (Why is it negative?) gravity pulls it down.
d) What does v_0 being positive mean? (Why is it positive?) shot up.
e) What is the velocity of the projectile? 224ft/sec.
f) What height is the projectile launched from?
0ft (the ground).

3) 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.

4) For each of the following quadratics fill in the table.

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	(-2,0) (6,0)	D: $(-\infty,\infty)$ R: $[-16,\infty)$	(0,-12)

Name: Key 1/19/2018 Algebra II – Quiz 14

1) Solve the following quadratics by factoring.

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

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

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

$1-2 \rightarrow -3$

b) $x^2 + 8x + 15 = 0$

$X = -5, -3$

	x	3
x	x^2	$3x$
5	$5x$	15

$3 \cdot 5$

2) 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 pulls it 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.

3) 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" ✓ not.

4) Solve the following quadratics using square roots.

a) $x^2 = 169$ $X = \pm 13$

b) $x^2 - 625 = 0$ $X = \pm 25$

c) $x^2 + 25 = 0$ $2i$

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

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

6) Identify the a, b, and c for the quadratic formula using the following.

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

$a = 1$

$b = 2$

$c = 9$

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

$-4 \quad -4$

$a = 3$

$b = -11$

$c = -4$

Name: Key 1/26/2018 Algebra II – Quiz 15

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

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

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

$\frac{2 \pm \sqrt{4 - 4 \cdot 9 \cdot 1}}{2}$ (40) $\frac{2 \pm 2\sqrt{10}}{2}$

$1 \pm \sqrt{10}$

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

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

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

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

2) 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

$4x - 1$ | $9x$ | $4x^2 - x$ | -2 | $-8x$ | 2

$-1 - 8 = -9$

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

3) 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.

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

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

$4 - 4 \cdot 3(1)$ (12) -8

~~1 Real~~ 2 Imag.

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

$1 - 4 \cdot \frac{1}{2} \cdot -3$

7

2 Real

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

$+16$ $+16$

$64 - 4 \cdot 16$

0 1 Real.

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

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

6) 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. $-5t(t-12)$

a) How long after being launched until the rocket hits the ground? 12sec

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

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

d) What is the highest it will reach?

$-5(6)^2 + 60(6)$

180m

Name: Key 2/16/2018 Algebra II – Quiz 18

1) Solve the following quadratics using square roots.

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

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

c) $x^2 + 25 = 0$
$-25 \quad -25$
$x^2 = \sqrt{-25} = \boxed{\pm 5i}$

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

a) $5(x-1) + 3yi = -15i - 20$
$5x - 5 = -20$
$\boxed{x = 3}$
$3y = -15$
$\boxed{y = -5}$

b) $x + 3xi = 4 + yi$
$x = 4$
$3x = y$
$\boxed{y = 12}$

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

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

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

4) Solve the following quadratics.

a) $x^2 - 10x + 26 = 0$
$\frac{10 \pm \sqrt{100 - 4 \cdot 26}}{2}$ (-4)
$\frac{10 \pm 2i}{2} = \boxed{5 \pm i}$

b) $x^2 - 10x + 37 = 0$
$\frac{10 \pm \sqrt{100 - 4 \cdot 37}}{2}$ (-48)
$\sqrt{12}$: 4, 3
$\frac{10 \pm 4i\sqrt{3}}{2}$
$\boxed{5 \pm 2i\sqrt{3}}$

5) Multiply the following complex numbers.

a) $(2 - i)(3 - 4i)$ $\boxed{2 - 11i}$

	2	$-i$
3	6	$-3i$
$-4i$	$-8i$	$4i^2$ (-1)

b) $2i^{70}(8i - 9)$ $\boxed{18 - 16i}$

$4 \overline{)70}$ = 17, 68, remainder (2)
$i^{70} = -1$
$-2(8i - 9)$
$18 - 16i$

6) Find the absolute value of the following complex numbers.

a) $|-2|$
2

b) $|-3 + 4i|$ $= 5$
$3^2 + 4^2 = c^2$
$25 = c^2$
$c = \boxed{5}$

c) $|-5i|$
5

Name: Key 2/23/2018 Algebra II – Quiz 19

1) Multiply the following complex numbers.

a) $(2+5i)(1-4i)$ $22-3i$

b) $3i^{28}(8i-9)$ $= 24i^2 - 27i$ $-24-27i$

2) Simplify the following.

a) $\frac{5}{2-3i}\frac{(2+3i)}{(2+3i)} = \frac{10+15i}{13}$

b) $\frac{3+4i}{1+2i}\frac{(1-2i)}{(1-2i)} = \frac{11+10i}{5}$ $\frac{11}{5}+\frac{10}{5}i$ $-1+2i$

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) $x^2-10x+30=0$ $\frac{10\pm\sqrt{100-4\cdot30\cdot1}}{2}$ $\frac{10\pm2i\sqrt{5}}{2} = 5\pm i\sqrt{5}$

b) $2x^2+6x+9=0$ $\frac{-6\pm\sqrt{36-4\cdot2\cdot9}}{2\cdot2=4}$ $\frac{-6\pm6i}{4}$ $\frac{-3\pm3i}{2}$

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

a) $i^{52}-i^{48}$ $1-1=0$

b) $i^{46}-i^{48}$ $-1--i = -1+i$

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

a) $y=x^2+12x-17$ -36 $(x+6)^2-53$ $V(-6,-53)$

b) $y=x^2+14x$ -49 $(x+7)^2-49$ $V(-7,-49)$

1) a)

	2	$5i$
1	2	$5i$
$-4i$	$-8i$	$-20i^2$ -1

20

2b)

	3	$4i$
1	3	$4i$
$-2i$	$6i$	$-8i^2$

$+8$

Name: Key 3/2/2018 Algebra II – Quiz 20

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

a) Center: $(-11,-8)$;Radius: 7

$(x+11)^2+(x+8)^2=49$

b) $(x-12)^2+(y+4)^2=12$ $(12,-4)$

Translated 3 units right and 7 units down $+3$ -7

$(x-15)^2+(x+11)^2=12$ $C(15,-11)$

$r=\sqrt{12}=2\sqrt{3}$

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

a) $4x+x^2-6y=12-y^2$

$+y^2$ $+9$

$x^2+4x+4+y^2-6y+9=12+4+9$

$(x+2)^2+(y-3)^2=25$ $C(-2,3)$ $r=5$

b) $x^2+y^2-18x+14y+81=0$

-81 -81

$x^2-18x+81+y^2+14y+49=-81+81+49$

$(x-9)^2+(y+7)^2=49$ $C(9,-7)$ $r=7$

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

a) $-6i+21$

$21+6i$

b) $-7+4i$

$-7-4i$

4) Solve the following quadratics.

a) $x^2-10x+20=0$

$\frac{10\pm\sqrt{100-4\cdot20}}{2}$ $\frac{10\pm2\sqrt{5}}{2}$ $5\pm\sqrt{5}$

b) $2x^2+8x+9=0$

$\frac{-8\pm\sqrt{64-4\cdot2\cdot9}}{2\cdot2}$ $64-72=-8$

$\frac{-8\pm2i\sqrt{2}}{4}$ $\frac{-4\pm i\sqrt{2}}{2}$

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

a) $i^{50}-i^{24}$

$i^2-i^0=-1-1=-2$

b) i^7-i^9

$i^3-i^1=-i-i=-2i$

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

a) $y=x^2+8x-13$

$x^2+8x+16-13-16$

$y=(x+4)^2-29$

$V(-4,-29)$

b) $y=x^2+6x$

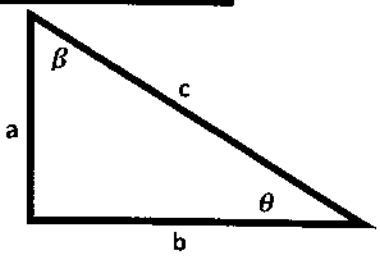
$x^2+6x+9-9$

$y=(x^2+3)^2-9$

$V(-3,-9)$

Name: 3/23/2018 Algebra II – Quiz 22

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	$7\sqrt{2} = 9.9$
b)	53°	37°	4	3	5

$7^2+7^2=c^2$

$\tan^{-1}(\frac{4}{3})=\theta$

$4^2+3^2=c^2$

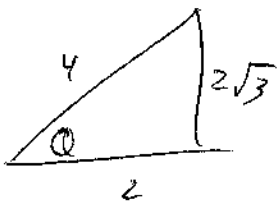
2) What are the definitions of the following trigonometric functions

$\sin(\theta)$ = opp/hyp	$\cos(\theta)$ = adj/hyp	$\tan(\theta)$ = opp/adj
$\csc(\theta)$ = hyp/opp	$\sec(\theta)$ = hyp/adj	$\cot(\theta)$ = adj/opp

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

Sine, cosine, tangent, cosecant, Secant, cotangent.

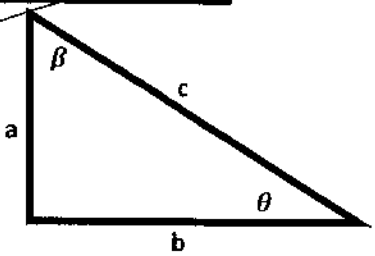
4) Using the triangle on the right and the values given, fill in the following chart.



Trig Function	a) $a = 2\sqrt{3}, b = 2, c = 4$
$\sin\theta$	$2\sqrt{3}/4 = \sqrt{3}/2$
$\cos\theta$	$2/4 = 1/2$
$\tan\theta$	$2\sqrt{3}/2 = \sqrt{3}$
$\csc\theta$	$2/\sqrt{3} = 2\sqrt{3}/3$
$\sec\theta$	2
$\cot\theta$	$1/\sqrt{3} = \sqrt{3}/3$

Name: 3/29/2018 Algebra II – Quiz 23

1)
Using the triangle on the right and the values given, find all the missing sides and angles. in the following chart.

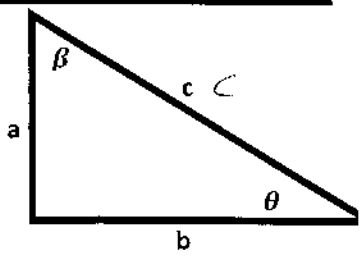


Given:	θ	β	a	b	c
a)	45°				7
b)			8		10
c)		30°		4	

Name: Key 3/29/2018 Algebra II – Quiz 23

1)

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



$7 \cdot \sin(45) = \frac{a}{7}\ 7$

Given:	θ	β	a	b	c
a)	45°	45°	4.95	4.95	7
b)	53°	37°	8	6	10
c)	60°	30°	6.93	4	8

$\sin(\theta) = \frac{8}{10}$

$\theta = \sin^{-1}\left(\frac{8}{10}\right)$

$4 \tan(60) = \frac{a}{4}\ 4$

2) 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

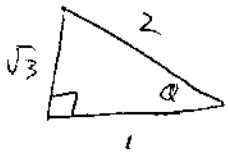
$\sec(\theta) =$ hyp/adj

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

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

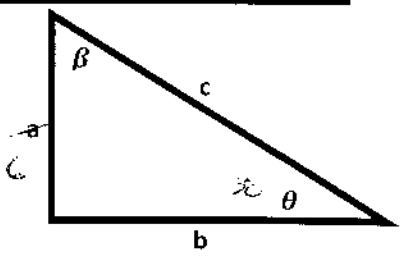
4) Using the triangle on the right and the values given, fill in the following chart.

Trig Function	a) $a = \sqrt{3}, b = 1, c = 2$
$\sin\theta$	$\sqrt{3}/2$
$\cos\theta$	$1/2$
$\tan\theta$	$\sqrt{3}$
$\csc\theta$	$2\sqrt{3}/3$
$\sec\theta$	2
$\cot\theta$	$\sqrt{3}/3$



Name: Key 4/6/2018 Algebra II – Quiz 24

1)
Using the triangle on the right and the values given, find all the missing sides and angles. in the following chart.



$\sin(30) = \frac{6}{c}$ $\quad c = \frac{6}{\sin(30)} = 12$

$12^2 = 6^2 + b^2$ $\quad b^2 = \sqrt{108}$

Given:	θ	β	a	b	c
a)	30°	60°	6	10.4	12
b)	~~27°~~	63°	4	8	8.94
c)	70°	20°	24.7	9	26.3

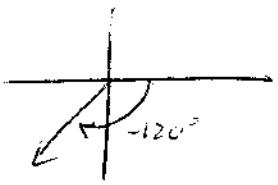
$\tan(\theta) = \frac{4}{8}$ $\quad \theta = \tan^{-1}\left(\frac{4}{8}\right)$

$9 \cdot \tan(70) = \frac{9}{9} \cdot 9$

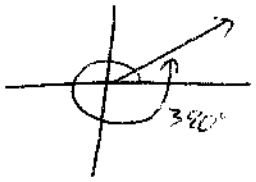
$4^2 + 8^2 = c^2$ $\quad c = 8.94$

2) Graph the following angles.

a) $-120°$



b) 390°



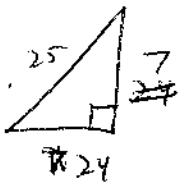
$24.7^2 + 9^2 = c^2$ $\quad c =$

3) For the following angles, find the reference angle.

a) $-120°$ $\quad 180 - 120 = 60°$

b) 390° $\quad -360 \quad 30°$

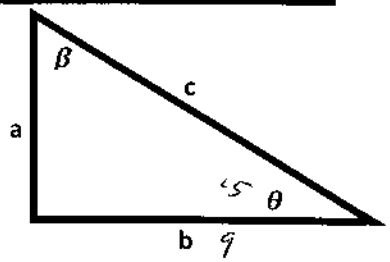
4) Using the triangle above and the values given, fill in the following chart.



Trig Function	a) $a = 7, b = 24$
$\sin\theta$	7/25
$\cos\theta$	24/25
$\tan\theta$	7/24
$\csc\theta$	25/7
$\sec\theta$	25/24
$\cot\theta$	24/7

Name: Key 4/13/2018 Algebra II – Quiz 25

1)
Using the triangle on the right and the values given, find all the missing sides and angles. in the following chart.



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

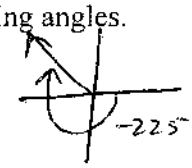
Given:	θ	β	a	b	c
a)	30°	60°	4	6.93	8
b)	45°	45°	8	8	11.3
c)	15°	75°	2.4	9	9.32

$8^2+8^2=c^2$

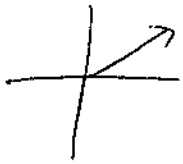
$9 \cdot \tan(15) = \frac{a}{9}$ 9

2) Graph the following angles.

a) $-225°$



b) 40°



3) For the following angles, find the reference angle.

a) $-225°$

$225° - 180° = 45°$

b) 40° 40°

4) Convert each measure from degrees to radians or from radians to degrees.

a) $\frac{5\pi}{12} \mid \frac{180}{\pi} = 75°$

b) $35° \mid \frac{\pi}{180} = \frac{7\pi}{36}$

5) Use the unit circle to find the exact value of each trigonometric function.

a) $\cos\left(\frac{2\pi}{3}\right)$ $\cos(120) = -\frac{1}{2}$

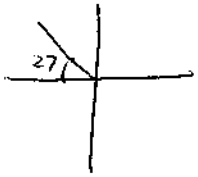
$\frac{2\pi}{3} \mid \frac{180}{\pi} = 120°$ 60°

b) $\sin(315°) = -\frac{\sqrt{2}}{2}$

6) Solve each equation to the nearest degree. Use the given restrictions.

a) $\sin(\theta) = 0.45$, for $90 < \theta < 180$

Ref. 27°



153°

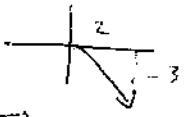
b) $\cos(\theta) = -0.334$ for $0 < \theta < 180$

~~Ref.~~

110°

Name: Key 4/20/2018 Algebra II – Quiz 26

1) Draw the following vector: $< 2, -3 >$



2) Find the component form of the vector $\overrightarrow{AB}$

$A(5,-9)\ \&\ B(-2,10)$ $\quad < -7, 19 >$

3) What is the magnitude of the each of the following vectors? Write your answer in the simplest radical form.

a) $< 8, 4 >$ $\quad \sqrt{8^2+4^2}$ $\quad 64+16=80$ $\quad 4\sqrt{5}$

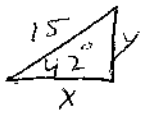
b) $< -7, 10 >$ $\quad 10^2+7^2$ $\quad \sqrt{149}$

4) Find each vector sum.

a) $< 1, 2 > + < 0, 6 >$ $\quad < 1, 8 >$

b) $< -3, 4 > + < 5, -2 >$ $\quad < 2, 2 >$

5) Find a vector in component form for the following:
Magnitude 15 and direction 42°

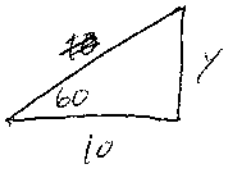


$\cos(42) = \frac{x}{15}$ $\quad \sin(42) = \frac{y}{15}$

$x = 11.1$ $\quad y = 10$

$< 11.1, 10 >$

6) Kenzie is standing 10ft away from a building. She measures the angle to the top of the building to be 60°. How tall is the building?



$\tan(60) = \frac{y}{10}$

$y = 17.3\text{ft}$