Oahu Mathematics League
Meet V
February 9, 2013

Answers for Meet V

Event 1: ALGEBRA II — Complex Numbers (No Trigonometry or Vectors)

A. Roosevelt $5 + 3i$

B. St. Louis 70

C. St. Louis $(625, 150)$

Event 2: GEOMETRY — Areas of Convex Quadrilaterals

A. Radford $\frac{8\sqrt{3}}{3}$

B. St. Louis 192

C. Radford $288\sqrt{2} - 360$

Event 3: ALGEBRA I — Systems of Linear Equations

A. Kalani $x = 6, y = 8$

B. Roosevelt $(-1, 2)$

C. Radford son is 18 years old, father is 54 years old

Event 4: ANALYTIC GEOMETRY — Lines and Circles in the Cartesian Plane

A. Kalani $y = \frac{1}{2}x + \frac{7}{2}$

B. St. Louis $6x + 4y + 3 = 0$

C. Radford $(2, -1)$

Event 5: GEOMETRY— Circles with Arcs, Chords, Secants, Tangents, and Angles

A. Roosevelt 120°

B. Kalani 95°

C. Kalani $x = 3,\ y = \frac{-3 + \sqrt{133}}{2}$

Event 6: ALGEBRA II — Matrices and Determinants

A. St. Louis 22

B. Radford $x = -5,\ 3$

C. Kalani $\begin{bmatrix} -\frac{1}{3} & -\frac{7}{3} \\ -\frac{25}{27} & -\frac{16}{27} \end{bmatrix}$

Team Question

St. Louis 40 inches

Meet V
February 11, 2012

Answers for Meet V

Event 1: ALGEBRA II — Complex Numbers (No Trigonometry or Vectors)

A. Pearl City $-\frac{8}{25}+\frac{6}{25}i$

B. Punahou $\frac{1}{3}+i$

C. Kailua $-\frac{1}{3}-\frac{1}{3}i$

Event 2: GEOMETRY — Areas of Convex Polygons

A. Punahou $\frac{7\sqrt{51}}{2}$

B. Punahou $18\sqrt{3}$

C. Punahou $\frac{80}{7}$ or $11\frac{3}{7}$

Event 3: ALGEBRA I — Systems of Linear Equations

A. Punahou 6 one-dollar bills, 11 five-dollar bills

B. Kailua $x=-\frac{3}{2},\ y=\frac{22}{3}$

C. Kailua \$ 6.75

Event 4: ANALYTIC GEOMETRY — Lines and Circles in the Cartesian Plane

A. Punahou $3x-4y+5=0$

B. Punahou $(x-1)^2+(y+4)^2=2$

C. Punahou $(x-1)^2+(y-3)^2=10$

Event 5: GEOMETRY — Circles with Arcs, Chords, Secants, Tangents, and Angles

A. Punahou $4-\sqrt{7}$

B. Punahou 75°

C. Punahou $7\sqrt{3}$

Event 6: ALGEBRA II — Matrices and Determinants

A. Punahou –2

B. Pearl City $\frac{36}{7}$

C. Punahou $\begin{bmatrix} 2 & 1 \\ -3 & -2 \end{bmatrix}$

Team Question

Punahou \$ 31.63

5

Oahu Mathematics League
Meet V
February 5, 2011

Answers for Meet V

Event 1: ALGEBRA II — Complex Numbers (No Trig or Vectors)

A. Castle $\pm 2\sqrt{3}\,i$

B. Sacred Hearts $-\frac{4}{5}-\frac{3}{5}i$

C. Aiea $2\sqrt{3}+3\sqrt{2}\,i$, $-2\sqrt{3}-3\sqrt{2}\,i$

Event 2: GEOMETRY — Areas of Convex Polygons

A. Castle $50\ \text{m}^2$

B. Aiea $72\sqrt{3}$

C. Kamehameha $\frac{27A\sqrt{2}}{5}$

Event 3: ALGEBRA I — Systems of Linear Equations

A. Aiea $(-5,-14)$

B. Aiea 28

C. Sacred Hearts 93

Event 4: ANALYTIC GEOMETRY — Lines and Circles in the Cartesian Plane

A. Kamehameha $\left(x-\frac{11}{2}\right)^2+(y-10)^2=9$

B. Sacred Hearts -30

C. Kamehameha $\left(-1+\frac{\sqrt{15}}{4},\frac{1}{4}\right)$, $\left(-1-\frac{\sqrt{15}}{4},\frac{1}{4}\right)$

Event 5: GEOMETRY — Circles with Arcs, Chords, Secants, Tangents, and Angles

A. Castle $2\sqrt{2}$ inches

B. Sacred Hearts 106 cm

C. Aiea $4\sqrt{10}$

Event 6: ALGEBRA II — Matrices and Determinants

A. Aiea 16

B. Sacred Hearts $\frac{1}{3}$

C. Kamehameha $\begin{bmatrix} 2 & 4 & 6 \\ -1 & -2 & -3 \end{bmatrix}$

Team Question

Castle Buster told the truth, Archie stole the base.

19

Oahu Mathematics League
Meet V
February 6, 2010

Answers for Meet V

Event 1: ALGEBRA II — Complex Numbers

A. Maryknoll $2i$

B. Mililani $0,\ 2,\ -1\pm\sqrt{3}\,i$

C. Maryknoll $\frac{\sqrt{5}}{10}+\frac{11i\sqrt{5}}{20}$ or $\frac{\sqrt{5}}{10}+\frac{11\sqrt{5}i}{20}$

Event 2: GEOMETRY — Areas of Convex Polygons

A. Maryknoll $\sqrt{3}$

B. Mililani 3:8 or $\frac{3}{8}$ or 0.375

C. Maryknoll $3\sqrt{2}$

Event 3: ALGEBRA I — Systems of Linear Equations

A. Moanalua $x=3,\ y=-4$

B. Moanalua 38

C. Maryknoll S = 8, L = 10

Event 4: ANALYTIC GEOMETRY — Lines and Circles in the Cartesian Plane

A. Maryknoll $x^2+y^2-100=0$

B. Moanalua $3x-4y+31=0$

C. Moanalua $2\sqrt{13}$

Event 5: GEOMETRY — Circles with Arcs, Chords, Secants, Tangents and Angles

A. Maryknoll $4\sqrt{2}$

B. Maryknoll $\frac{1+\sqrt{5}}{2}$

C. Mililani 220°

Event 6: ALGEBRA II — Matrices and Determinants

A. Mililani $\begin{bmatrix}-4 & 3\\ 3 & -2\end{bmatrix}$

B. Maryknoll 14

C. Mililani -60

Team Question

Maryknoll

TEAM	Number of GOLD	Number of SILVER	Number of BRONZE
Allspice	3	6	0
Basil	3	4	3
Coriander	4	0	7

Oahu Mathematics League
Meet V
February 14, 2009

Answers for Meet V

Event 1: ALGEBRA II — Complex Numbers (No Trigonometry or Vectors)

A. McKinley $-i$

B. Damien $\frac{16}{169}-\frac{63}{169}i$

C. Damien $1+i$

Event 2: GEOMETRY — Areas of Convex Polygons

A. Damien $54+25\sqrt{5}$

B. Waipahu $48\sqrt{3}$

C. McKinley $1152\sqrt{2}-1440$

Event 3: ALGEBRA I — Systems of Linear Equations

A. McKinley $x=-\frac{6}{5},\ y=\frac{5}{2}$ or $x=-1.2, y=2.5$

B. Damien $x=5, y=-2$

C. McKinley 1,806

Event 4: ANALYTIC GEOMETRY — Lines and Circles in the Cartesian Plane

A. Waipahu $4+\sqrt{3}$

B. Damien $\left(x-\frac{3}{2}\right)^2+(y-4)^2=16$

C. Waipahu $x^2+y^2+8\sqrt{3}y+21=0$

Event 5: GEOMETRY — Circles with Arcs, Chords, Secants, Tangents, and Angles

A. Damien 35°

B. Waipahu $25\frac{3}{5}$ or 25.6 or $\frac{128}{5}$

C.MCKINLEY $\frac{3}{2}$ or 1.5

Event 6: ALGEBRA II — Matrices and Determinants

A. McKinley $\frac{-5}{7}$

B. Damien 9

C. Waipahu $\begin{bmatrix} 21 & 5 \\ 4 & 24 \end{bmatrix}$

Team Question

McKinley 5 cm

Oahu Mathematics League
Meet 5
February 16, 2008

Answers for Meet 5

Event 1: Algebra II – Complex Numbers

A. Moanalua $\frac{-9}{2}+\frac{7}{2}i$

B. Kamehameha $\pm 8i$

C. Kalani $\sqrt{6}$

Event 2: GEOMETRY – Areas of Complex Polygons

A. Moanalua 60 ½ **or** 60.5 **or** 121/2

B. Sacred Hearts $32\sqrt{3}$

C. Kalani 250

Event 3: ALGEBRA I – Systems of Linear Equations

A. Kamehameha $126

B. Sacred Hearts 4

C. Sacred Hearts 28

Event 4: ANALYTIC GEOMETRY – Lines and Circles in the Cartesian Plane

A. Mid-Pacific 6/5 **or** 1.2 **or** 1 1/5

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

C. Moanalua 5

Event 5: GEOMETRY – Circles with Arcs, Chords, Secants, Tangents, and Angles

A. Kalani 42

B. Mid-Pacific 156°

C. Kamehameha $2\sqrt{2}$

Event 6: ALGEBRA II – Matrices and Determinants

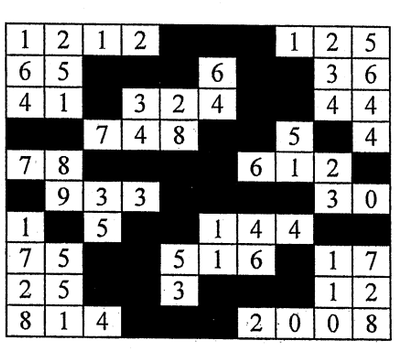
A. Moanalua $\begin{bmatrix} 84 & 56 & 28 \\ 140 & 112 & 28 \\ 0 & 56 & 56 \end{bmatrix}$

B. Kamehameha x = 1/2, y = 8, z = 0

C. Kalani $\begin{bmatrix} \frac{1}{3} & \frac{2}{3} \\ \frac{-8}{3} & \frac{-1}{3} \\ 2 & 0 \end{bmatrix}$

Team Question

Mid-Pacific



Oahu Mathematics League
Meet 5
February 17, 2007

Answers for Meet 5

Event 1: Algebra II – Complex Numbers (No Trig or Vectors)

A. Damien $36-48i$

B. Damien 0

C. Waipahu $\frac{1}{3}-\frac{\sqrt{5}}{3}i, \frac{1}{2}-\frac{\sqrt{5}}{2}i$

Event 2: GEOMETRY – Areas of Complex Polygons

A. Waipahu 12

B. St. Francis 9, 17

C. Damien $100\sqrt{2}$

Event 3: ALGEBRA I – Systems of Linear Equations

A. St. Francis 68

B. Waipahu (-4, 5)

C. St. Francis $20.10

Event 4: ANALYTIC GEOMETRY – Lines and Circles in the Cartesian Plane

A. Waipahu $x+2y-8=0$

B. Damien $4x-3y-2=0$

C. St. Francis $x^2+y^2-10x-14y-26=0$

Event 5: GEOMETRY – Circles with Arcs, Chords, Secants, Tangents, and Angles

A. Waipahu 276°

B. Damien 36

C. Waipahu 50

Event 6: Algebra II – Matrices and Determinants

A. St. Francis $x=\frac{1}{2}, y=\frac{3}{4}$ $x=\frac{1}{2}, y=\frac{3}{4}$

B. Waipahu $\begin{bmatrix} 14 & 12 \\ -8 & 7 \end{bmatrix}$

C. Waipahu $\begin{bmatrix} -16 & 7 \\ 45 & -19 \end{bmatrix}$

Team Question

Waipahu $6\sqrt{3}+24$

Oahu Mathematics League

Meet 5

February 18, 2006

Answers for Meet 5

Event 1: Algebra II – Complex Numbers (No Trigonometry or Vectors)

A. Education Lab. 11

B. Roosevelt $-i$

C. Maryknoll $-5+2i,\ 5-2i$

Event 2: Geometry – Areas of Convex Polygons

A. Kalani 144

B. Roosevelt 240

C. Education Lab. $4\sqrt{2}$

Event 3: Algebra I – Systems of Linear Equations

A. Kalani $\left(\frac{5}{2}, -\frac{3}{8}\right)$

B. Kalani Abel: 14 years, Baker: 32 years

C. Maryknoll 3 m.p.h.

Event 4: Analytic Geometry – Lines and Circles in the Cartesian Plane

A. Kalani $4x+5y-53=0$

B. Maryknoll $(x-4)^2+(y-3)^2=25$

C. Roosevelt $y=-2x+2$

Event 5: Geometry – Circles with Arcs, Chords, Secants, Tangents, and Angles

A. Maryknoll $\frac{12}{5}$

B. Kalani 52°

C. Maryknoll 47°

Event 6: Algebra II – Matrices and Determinants

A. Kalani –34

B. Education Lab. $\begin{bmatrix} 5 & 17 \\ 13 & 37 \end{bmatrix}$

C. Kalani $\begin{bmatrix} 38 & -24 \\ -60 & 38 \end{bmatrix}$

Team Question

Roosevelt $x=1, y=0, z=1$

Oahu Mathematics League

Meet 5

February 12, 2005

Answers for Meet 5

Event 1: Algebra II – Complex Numbers (No Trigonometry or Vectors)

A.	Kaiser	14
B.	Damien	i
C.	Moanalua	$\frac{77}{5}-\frac{19}{5}i$ or $15.4-3.8i$

Event 2: Geometry – Areas of Convex Polygons

A.	St. Francis	12
B.	Maui	89
C.	*Mystery*	$24\sqrt{3}$

Event 3: Algebra I – Systems of Linear Equations

A.	Maui	$x=-\frac{2}{3}$, $y=-\frac{1}{3}$
B.	St. Francis	–17, 11
C.	*Mystery*	Train A: 36 km/hr; Train B: 54 km/hr

Event 4: Analytic Geometry – Lines and Circles in the Cartesian Plane

A.	Maui	$y=-\sqrt{3}x-\sqrt{3}$
B.	Kaiser	$x^2+y^2-12y-64=0$
C.	St. Francis	$3x^2+3y^2+3x-7y-16=0$

Event 5: Geometry – Circles with Arcs, Chords, Secants, Tangents, and Angles

A.	Hanalani	65°, 115°
B.	Moanalua	$\frac{25\sqrt{6}}{24}$
C.	Damien	$\frac{5\sqrt{10}}{2}$

Event 6: Algebra II – Matrices and Determinants

A.	Damien	–1
B.	*Mystery*	$\begin{bmatrix} 1 & 0 \\ 2 & -1 \end{bmatrix}$
C.	Hanalani	$\begin{bmatrix} 1 \\ 3 \\ -1 \end{bmatrix}$

Team Question

Damien

length $=\frac{\sqrt{6}+\sqrt{2}}{2}$

width $=\frac{\sqrt{6}-\sqrt{2}}{2}$

Oahu Mathematics League

Meet 5

February 14, 2004

Answers for Meet 5

Event 1: Analytic Geometry – Lines and Circles in the Cartesian Plane

A. Farrington $(4, 4)$

B. Sacred Hearts $6x + 5y - 13 = 0$ or $-6x - 5y + 13 = 0$

C. Farrington $3x + 4y - 38 = 0$ or $-3x - 4y + 38 = 0$

Event 2: Algebra I – Systems of Linear Equations

A. Farrington $x = 2,\ y = 3\frac{3}{7}$ or $x = 2,\ y = \frac{24}{7}$

B. Sacred Hearts $\dfrac{23b}{2}$ or $11\frac{1}{2}b$

C. Farrington 9 feet

Event 3: Geometry – Areas of Convex Polygons

A. Farrington 32 square feet

B. Sacred Hearts $32\sqrt{3}$

C. Farrington $6\sqrt{3}$

Event 4: Algebra II – Complex Numbers (No Trigonometry or Vectors)

A. Farrington $\frac{1}{5}$

B. Farrington $\frac{1}{5} + i$

C. Sacred Hearts $\frac{11}{2} - \frac{1}{2}i$

Event 5: Geometry – Circles with Arcs, Chords, Secants, Tangents, and Angles

A. Farrington 27

B. Farrington 2 : 1

C. Sacred Hearts $9\sqrt{3}$

Event 6: Algebra II – Matrices and Determinants

A. Sacred Hearts 169

B. Farrington $-1,\ \frac{14}{5}$

C. Sacred Hearts $a = 3, b = -2, c = 5$

Team Question

Sacred Hearts 18

Oahu Mathematics League

Meet 5

February 22, 2003

Answers for Meet 5

Event 1: Analytic Geometry – Lines and Circles in the Cartesian Plane

A.	Kailua	$(x-4)^2+(y-1)^2=10$
B.	HBA	$3x+y=-20$ or $-3x-y=20$
C.	Kailua	$(x-4)^2+(y+6)^2=16$ and $(x+4)^2+(y-18)^2=16$

Event 2: Algebra I – Systems of Linear Equations

A.	HBA	6 @ \$1, 11 @ \$5
B.	Pearl City	$x=5m, y=-2n$
C.	Kailua	9

Event 3: Geometry – Areas of Convex Polygons

A.	HBA	$\frac{10\sqrt{3}}{3}$
B.	Pearl City	$18\sqrt{3}$
C.	Kailua	$24-8\sqrt{3}$

Event 4: Algebra II – Complex Numbers (No Trigonometry or Vectors)

A.	HBA	$-\frac{17}{15}-\frac{26}{15}i$
B.	Pearl City	$\frac{\sqrt{205}}{5}$
C.	Kailua	$1+\sqrt{3}i,\ -1-\sqrt{3}i,\ \sqrt{3}+i,\ -\sqrt{3}-i$

Event 5: Geometry – Circles with Arcs, Chords, Secants, Tangents, and Angles

A.	HBA	$5\sqrt{3}$
B.	Pearl City	$4\sqrt{3}$
C.	HBA	$2\sqrt{41}-10$

Event 6: Algebra II – Matrices and Determinants

A.	Pearl City	$a=3,\ b=-2$
B.	HBA	245
C.	Kailua	–9

Team Question

	HBA	a) 6.9% b) 3.9%

Oahu Mathematics League

Meet 5

February 16, 2002

Answers for Meet 5

Event 1: Analytic Geometry – Lines and Circles in the Cartesian Plane

A.	Waipahu	$2x+9y+57=0$
B.	Castle	$(x-1)^2+(y+1)^2=61$
C.	Pearl City	$(x-2)^2+(y-1)^2=10$

Event 2: Algebra I – Systems of Linear Equations

A.	Kaiser	(4, –1)
B.	Damien	270 student tickets, 360 general admission tickets
C.	Waipahu	(–8, –4)

Event 3: Geometry – Areas of Convex Polygons

A.	Kaiser	18
B.	Pearl City	$\frac{147\sqrt{3}}{4}$
C.	Waipahu	$49\sqrt{2}+\frac{49}{2}$

Event 4: Algebra II – Complex Numbers (No Trigonometry or Vectors)

A.	Pearl City	$-6+9i$
B.	Kaiser	$a=4,\ b=-4$
C.	Castle	$x=-\frac{3}{4},\ y=\frac{1}{3}$

Event 5: Geometry – Circles with Arcs, Chords, Secants, Tangents, and Angles

A.	Waipahu	$6\sqrt{6}$
B.	Castle	$-5+5\sqrt{2}$
C.	Pearl City	3

Event 6: Algebra II – Matrices and Determinants

A.	Pearl City	$a=2,\ b=-8,\ c=5,\ d=3$
B.	Waipahu	–4, –2
C.	Waipahu	$B=\begin{bmatrix}-8 & 4\\ 10 & -5\end{bmatrix}$

Team Question

	Castle	122

OAHU MATHEMATICS LEAGUE
Meet 5
February 10, 2001

Answers for Meet 5

Event 1: ANALYTIC GEOMETRY - Lines and Circles in the Cartesian Plane

A.	Kailua	135°
B.	Kailua	~~15° or~~ $\frac{\pi}{12}$ 75°
C.	Sacred Hts	Center (1, -7)

Event 2: ALGEBRA I - Systems of Linear Equations

A.	Radford	(5, 4)
B.	Kailua	$a = 5, b = 2$
C.	Pearl City	96

Event 3: GEOMETRY - Areas of Convex Polygons

A.	Sacred Hts	48
B.	Pearl City	15
C.	Sacred Hts	$108\sqrt{3}$ sq. cm

Event 4: ALGEBRA II - Complex Numbers (no trig or vectors)

A.	Pearl City	$3, -\frac{3}{2} \pm \frac{3\sqrt{3}}{2}i$
B.	Sacred Hts	$\frac{1}{29} - \frac{17}{29}i$
C.	Radford	$-\frac{15}{4}i$

Event 5: GEOMETRY - Circles with Arcs, Chords, Secants, Tangents, and Angles

A.	Kailua	$2\sqrt{19}$
B.	Radford	3
C.	Pearl City	$\sqrt{65}$

Event 6: EXTRA-CURRICULAR - Permutations and Combinations

A.	Radford	34,650
B.	Kailua	8
C.	Pearl City	76,145

Team Question

Kailua	2102001

OAHU MATHEMATICS LEAGUE
Meet 5
February 12, 2000

Answers for Meet 5

Event 1: ANALYTIC GEOMETRY - Lines and Circles in the Cartesian Plane

A. Molokai $3x + 5y + 31 = 0$

B. Molokai $x^2 + y^2 - 4x - 4y + 3 = 0$

C. Radford $-\frac{2}{5}$, 10

Event 2: ALGEBRA I - Systems of Linear Equations

A. Waipahu $x = -5,\ y = 3$

B. Molokai 10 two-worker stations, 6 three-worker stations

C. Waipahu Father is 36, son is 9

Event 3: GEOMETRY - Areas of Convex Polygons

A. Waipahu $6 + \sqrt{6}$

B. Waipahu $72\sqrt{5}$

C. Molokai $42\sqrt{3}$

Event 4: ALGEBRA II - Complex numbers (no trig or vectors)

A. Radford $2i$

B. St. Francis $2 - 7i,\ 7 - 2i$

C. St. Francis $\frac{-9}{100} - \frac{3}{25}i$

Event 5: GEOMETRY - Circles with Arcs, Chords, Secants, Tangents, and Angles

A. Molokai $5\sqrt{3}$

B. Molokai $4\sqrt{10}$

C. Radford $\frac{9-4\sqrt{3}}{3}$ *or* $3 - \frac{4}{3}\sqrt{3}$

Event 6: EXTRA-CURRICULAR - Permutations and Combinations

A. St. Francis 840

B. Waipahu 2,880

C. Radford 378

Team Question

Waipahu 75

Oahu Mathematics League

Meet 5

February 6, 1999

Answers for Meet 5

Event 1: Analytic Geometry – Lines and Circles in the Cartesian Plane

A. $(-17 \pm 2\sqrt{2},\ 23),\ (-17,\ 23 \pm 2\sqrt{2})$

B. $(x-4)^2+(y-2.5)^2=22.25$ or $(x-4)^2+(y-\frac{5}{2})^2=\frac{89}{4}$

C. $(x+5)^2+(y+12)^2=169,\ (x-5)^2+(y-12)^2=169$

Event 2: Algebra I – Systems of Linear Equations

A. $x=-4, y=-6$

B. -12

C. 69 inches

Team Question

1 1	2 3	3 6	9		4 2	5 1	6 1
7 2	2 5				8 8	3	7
9 1	9			10 2			1
		11 2	2	1			
	12 5	3	2				
13 3		1				14 1	15 2
16 4	17 3	18 2			19 3	1	7
20 2	7	0		21 1	9	9	8

Event 3: Geometry – Areas of Convex Polygons

A. 16

B. $\frac{35\sqrt{3}}{4}$

C. 4 units

Event 4: Algebra II – Complex Numbers (no trig or vectors)

A. $-\frac{\sqrt{3}}{3}i$

B. $-\frac{18}{157}-\frac{33}{157}i$

C. $-\frac{29}{85}$

Event 5: Geometry – Circles with Arcs, Chords, Secants, Tangents, and Angles

A. 30°

B. 4 units

C. 140°

Event 6: Extra Curricular – Permutations and Combinations

A. ~~34,580~~ 26,880

B. 14,000

C. 1,278,400,000