5

TAMPA BAY TECH INVITATIONAL – MARCH 31, 2001

MASTER KEY

			Individual			
Question #	Algebra I	Geometry	Algebra II	Pre-Calculus	Calculus	Statistics
1	A	A	A	C	D	C
2	C	D	C	A	A	B
3	A	A	D	~~B~~ D	D	A
4	C	B	B	B	C	C
5	D	C	C	C	A	C
6	D	C	C	A	A	D
7	A	D	B	A	A	A
8	C	B	B	E	C	B
9	D	C	C	A	B	C
10	D	B	D	B	E no pt exists	A
11	B	C	B	D	C	C
12	D	D	A	C	B	B
13	C	B	A	A	C	D
14	B	C	A	D	A	A
15	A	C	A	D	C	C
16	A	B OR E	C	B	C	D
17	A	A	B	B	A	C
18	B	A	C	B	D	A
19	C	B	A	B	D	E none true
20	D	B	A	B	B	B
21	B	D	C	C	A	A
22	**A**	**B**	**D**	**A**	D	C
23	B	D	A	B	C	B
24	**D**	**B**	D	B	B	A
25	D	E equidistant	D	C	~~D~~ Thrown Out	~~D~~
26	**C**	**B**	**B**	**B**	A	**B**
27	C	B	C	C	A	B
28	C	C	B	B	C	D
29	A	B	B	D	D	B
30	B	D	A	D	A	C
			Team			
1	-11.12	39.3	3,626	126.4	.42	
2	3/50	$3+10\pi$	12,217.7	.2125 or 17/80	470	
3	4	1410	3,165	$\sqrt{2}/2$	141	
4	110/7	$6\sqrt{26}$	112,474	$104 + 4\pi$	$e^4 - e^2$	
5	$485\pi/6$	-26	348,408	5.53	14 / 5 or 2.8	
6	1178	36 feet	8 / 81	8	1 / 2 ln2	
7	-27/8	$76\pi\ ft^2$	9 / 8	13 / 3	$4-2\sqrt{2}$ OR $w = \frac{2}{\cos\theta + 1}$	
8	16.2	C,B,D,A	1,219,512	1898	$11-\sqrt{31}$	
9	8	-3598	11,345	8.62	8π / 5	
10	0	$448\sqrt{51}$	9	$\sqrt{2}/2$	63	
11	7 OR 102.9	1/16	9	3	40	
12	-24	$3708+720\sqrt{3}$	242	19:31 "odds"	192 ft / s	
13	2.5×10^{-9}	$6-\frac{3\sqrt{3}}{4}$	32	62.5	6	
14	$500\sqrt{3}+75$	53.2	5.4	2	6π	
15	58.8	2	32,640	7.1	43,875 ft - lb	

Team Solutions – Geometry Tampa Bay Tech Invitational March 31, 2001

1. Volume of a cylinder with radius 5 and height 0.5. $\pi r^2 h = \pi(5)^2(0.5) =$ **39.3**

2. A = 0, B = 9 (definition of a nonagon), C = 6, D = Circumf. = $\pi d = 10\pi$. $0+9-6+10\pi =$ **$3+10\pi$**

3. Draw line of sight parallel to the ground. The angle of depression is 7 degrees. Let x = the difference between the two hills. tan 7 = x/10506 (5280 feet in a mile x 2) x = 1296.604 2707-1297 = **1410 feet**

4. Draw a segment from center to center. This is x. Draw a segment 30 in long forming a rectangle with dimensions8 in by 30 in. The remaining section of the 14 in radius is 6 in. Use Pythagorean Theorem $6^2 + 30^2 = X^2 = 936$. Simplify to $6\sqrt{26}$

5. $m\overset{\frown}{DC} = 64, m\overset{\frown}{BD} = 116, m\angle BCD = 58, m\angle BDA = 58, m\angle ABD = 58, m\angle A = 64, m\angle CDE = 32$
$64 - 116 + 58 - 58 + 58 - 64 + 32 = -26$

6. Proportions 6/x = 7.5/45 x = **36 feet**

7. The area of ¾ circle w/ a radius of 10 ft and the area of ¼ circle w/ a radius of 2 ft.
$\frac{3}{4}\pi 10^2 + \frac{1}{4}\pi 2^2 = 75\pi + \pi = 76\pi\, ft^2$

8. A. V=1/3(BH)=16.755 B.V=BH=37.699 C. V=Xcubed=64 D. V=4/3(pi x r cubed) = 33.510 therefore **C,B,D,A**

9. A = 5, B = 12, C = 3780, D = 165. 5+12-3780+165 = **-3598**

10. Hexagon short diagonal is a 30-60-90. ½ of the diag. is $4\sqrt{3}$ times 2 $= 8\sqrt{3}$ Square is a 45-45-90 diag. is $7\sqrt{2}$.
Circle use distance formula $\sqrt{(10-16)^2 + (-2-8)^2} = \sqrt{136}$ = radius so x 2
then multiply & simplify to get $448\sqrt{51}$

11. Length of shaded tri. hypotenuse is 2. Use 30-60-90 to find the area of one triangle, $\frac{\sqrt{3}}{2}$ multiply by two $= \sqrt{3}$

Area of large triangle is $\frac{8^2\sqrt{3}}{4}$. Ratio = $\frac{\sqrt{3}}{16\sqrt{3}} = \frac{1}{16}$

12. Tangents form 90° angles with radii. Use 30-60-90 to find $x = 6\sqrt{3}$. Two radii, CG, and DG for a quadrilateral.
$90 + 90 + 120 + y = 360$. $y = 60$. $60 + 6\sqrt{3}$. $(60 + 6\sqrt{3})^2$ FOIL to get $3708 + 720\sqrt{3}$

13. A = 2, B = $\frac{3\sqrt{3}}{4}$, C = 4. $6 - \frac{3\sqrt{3}}{4}$

14. radius of circle = 8.462843. Circumf. = πd = (3.141592)(16.9256) = **53.2**

-2	1	0	-2	1
-4	4	2	-4	4
6	6	4	6	6

15. $-32 + 12 + -24 - 0 - -24 - -16 = 2A = |-4| = 2A$, $A = 2$.