

## Test 1 Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each question, write on the space provided the numeral preceding the word or expression that best completes the statement or answers the question. [48]

1. Which of the following real life objects would most likely be modeled by a pyramid?

- (1) picture frame      (2) tent      (3) pool      (4) house      1 \_\_\_\_\_

2. Each of the following shapes is inscribed in a circle with a radius of 5 cm. Which of the shapes has a perimeter closest in value to the circumference of the circle?

- (1) a square      (3) a regular octagon  
(2) a regular hexagon      (4) a regular dodecagon      2 \_\_\_\_\_

3. Which type of shape can represent a two-dimensional cross-section of a sphere?

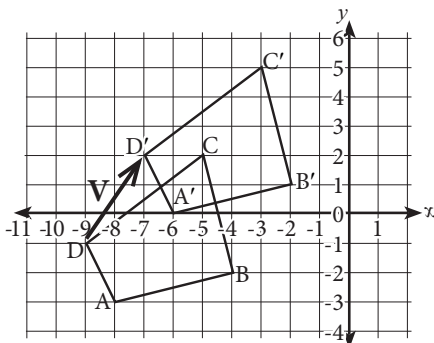
- (1) circular      (2) triangular      (3) square      (4) rectangular      3 \_\_\_\_\_

4. Segment  $ST$  has endpoints of  $S(-2, 4)$  and  $T(-6, 0)$ . What is the midpoint of segment  $ST$ ?

- (1)  $(2, 2)$       (2)  $(-4, -2)$       (3)  $(-4, 2)$       (4)  $(-8, 4)$       4 \_\_\_\_\_

5. Vector  $V$  describes the translation that maps quadrilateral  $ABCD$  to quadrilateral  $A'B'C'D'$  shown to the right. What is the magnitude of  $V$ ?

- (1) 5      (3) 13  
(2)  $\sqrt{5}$       (4)  $\sqrt{13}$



5 \_\_\_\_\_

6. Which type of proof uses boxes and arrows to show the logical connections between statements?

- (1) two-column table      (3) flowproof  
(2) paragraph proof      (4) indirect proof      6 \_\_\_\_\_

7. Which of the following is the most precise definition of perpendicular lines?

- (1) Two lines that intersect in a plane.  
(2) Two lines that intersect at right angles.  
(3) Two lines that go in opposite directions.  
(4) Two lines that never cross.      7 \_\_\_\_\_

# GEOMETRY

## Test 1

8. What is the point of concurrency of the medians in a triangle?

- (1) altitude (2) incenter (3) circumcenter (4) centroid 8 \_\_\_\_\_

9. If  $\ell_1$  and  $\ell_2$  are two distinct lines that are parallel to another line  $\ell_3$ , then  $\ell_1$  and  $\ell_2$  are

- (1) perpendicular to each other. (3) both equidistant.  
(2) parallel to each other. (4) bot equidistant from the third line. 9 \_\_\_\_\_

10. Many of the ancient pyramids of Egypt are still buried in the sand. Satellites can now locate some of these buried structures using infrared technology. One of the buried pyramids has a height of 250 feet and square base with a side length of 340 feet. How much sand, to the nearest thousand cubic feet, is displaced by the pyramid?

- (1) 85,000 (2) 7,083,000 (3) 9,633,000 (4) 28,900,000 10 \_\_\_\_\_

11. In a right triangle  $ABC$ , where  $m\angle C = 90^\circ$ , which of the following statements is always true?

- (1)  $\sin A = \tan B$  (3)  $\cos A = \tan B$   
(2)  $\sin A = \cos B$  (4)  $\tan A = \tan B$  11 \_\_\_\_\_

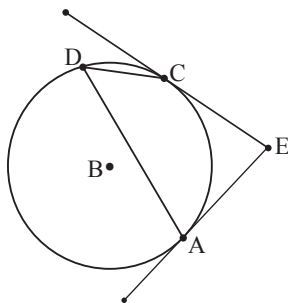
12. In the diagram to the right,

$\overline{EC}$  is tangent to circle  $B$  at  $C$ .

$\overline{EA}$  is tangent to circle  $B$  at  $A$ .

If  $m\angle CDA = 50^\circ$ , find  $m\widehat{CA}$ ?

- (1)  $50^\circ$   
(2)  $80^\circ$   
(3)  $90^\circ$   
(4)  $100^\circ$  12 \_\_\_\_\_



13. Which transformation preserves both distance and angle?

- (1) translation (2) horizontal stretch  
(3) vertical stretch (4) dilation 13 \_\_\_\_\_

14. Which equation represents a line that is parallel to the line  $2y - 10 = x$ ?

- (1)  $2y = 4x - 6$  (2)  $2y = x + 6$  (3)  $2y = -x - 10$  (4)  $2y = -4x - 8$  14 \_\_\_\_\_

15. The diagonals of a square intersect at the origin. Which transformation would *not* map the square onto itself?

- (1)  $r_{y\text{-axis}}$  (2)  $R_{-270^\circ}$  (3)  $T_{3,-3}$  (4)  $r_{y=-x}$  15 \_\_\_\_\_

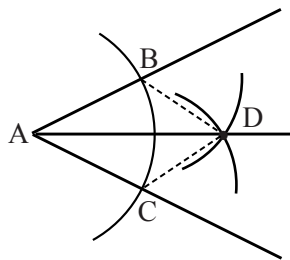
16. Katrina is making a scaled drawing for an L shaped garden on graph paper using the scale below. The vertices of the L shape are as follows:  $(0, 0)$ ,  $(10, 0)$ ,  $(10, 2)$ ,  $(2, 2)$ ,  $(2, 6)$ , and  $(0, 6)$ . Using the scale below, what is the perimeter of the garden, in feet?

1 space = 2 feet

- (1) 28 (2) 32 (3) 56 (4) 64 16 \_\_\_\_\_

Test 1

17. The figure above shows the construction of an angle bisector.  $B$  and  $C$  are each connected to  $D$ . The construction marks can be used to prove  $\triangle ABD$  is congruent to  $\triangle ACD$ . Given a rigid motion that would reflect  $\triangle ABD$  in  $\overline{AD}$ , such that point  $B$  maps to point  $C$  and the radii in the arcs are congruent, these triangles could be proven congruent by



- (1) SAS only
- (2) SSS or SAS
- (3) SSS only
- (4) ASA or HL

17 \_\_\_\_

18. Winter Creations is designing a box to hold twenty-four of their top selling spherical holiday ornaments. Each ornament has a radius of 1.75 inches. They want to configure the ornaments in two layers of four ornaments by three ornaments. To prevent breakage, the company wants  $\frac{1}{2}$  inch of packaging between any two adjacent ornaments as well as between the ornaments and the sides of the box. Find the smallest possible dimensions of the box that meets these criteria.

- (1)  $12'' \times 9'' \times 6''$
- (2)  $13.5'' \times 10'' \times 6.5''$
- (3)  $14'' \times 10.5'' \times 7''$
- (4)  $16.5'' \times 12.5'' \times 8.5''$

18 \_\_\_\_

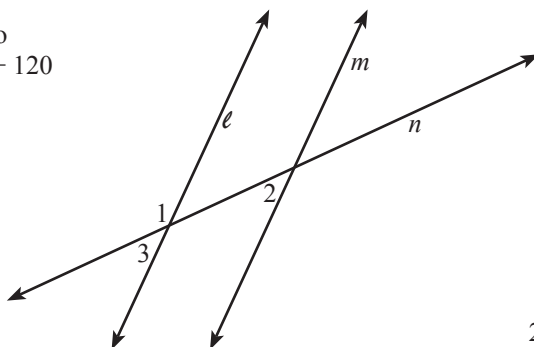
19. To construct a circle inscribed in a triangle, what is the procedure for finding the center and radius of the circle?

- (1) Construct the angle bisectors for the 3 angles in the triangle. The point of concurrency is the center of the circle. The radius is the perpendicular distance from the center to any side of the triangle.
- (2) Construct the altitude to each side of the triangle. The point of concurrency is the center of the circle. The radius is the  $\frac{2}{3}$  the distance from the center to the furthest vertex of the triangle.
- (3) Construct the perpendicular bisector of each side of the triangle. The point of concurrency is the center of the circle. The radius is the distance from the center to any vertex of the triangle.
- (4) Construct the median to each side of the triangle. The point of concurrency is the center of the circle. The radius is the perpendicular distance to any side of the triangle.

19 \_\_\_\_

20. Line  $l$  is parallel to line  $m$ . If  $m\angle 1 = 2x + 120$  and  $m\angle 2 = x^2 - 6x$ , what is  $m\angle 3$ ?

- (1)  $10^\circ$
- (2)  $30^\circ$
- (3)  $40^\circ$
- (4)  $140^\circ$



20 \_\_\_\_

# GEOMETRY

## Test 1

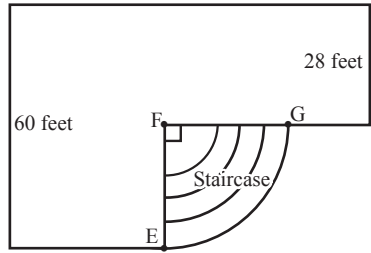
21.  $\triangle MNO \cong \triangle PQR$  Which of the following statements is *not* necessarily true?

- (1)  $\overline{NO} \cong \overline{QR}$  (3)  $\angle OMN \cong \angle RQP$   
 (2)  $\overline{QP} \cong \overline{NM}$  (4)  $\angle NOM \cong \angle QRP$  21 \_\_\_\_\_

22. Which choice correctly identifies the center and the radius of the circle expressed by the equation  $x^2 + y^2 + 10x - 2y - 10 = 0$ ?

- (1) C: (5, -1)  $r = 6$  (3) C: (-5, 1)  $r = 6$   
 (2) C: (5, -1)  $r = \sqrt{10}$  (4) C: (-5, 1)  $r = \sqrt{10}$  22 \_\_\_\_\_

23. The owners of a new, L-shaped office complex are building a shallow staircase up to the main doors of the building as shown in the accompanying diagram. The staircase is a sector of a circle with radius  $\overline{EF}$ . Find the length around the lowest step, represented by  $\widehat{EG}$ , to the *nearest foot*.



- (1) 44 (2) 50 (3) 94 (4) 201 23 \_\_\_\_\_

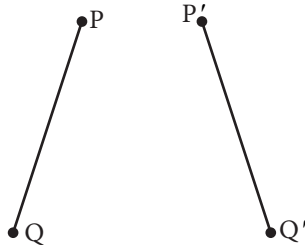
24. Which description is *always* the composition of two different types of transformations?

- (1) line reflection (2) rotation (3) translation (4) glide reflection 24 \_\_\_\_\_

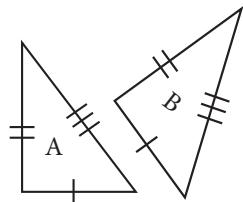
## Part II

**Answer all 8 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]**

25.  $\overline{P'Q'}$  is the image of  $\overline{PQ}$  after a line reflection. Use a compass and straightedge to draw a line of reflection.



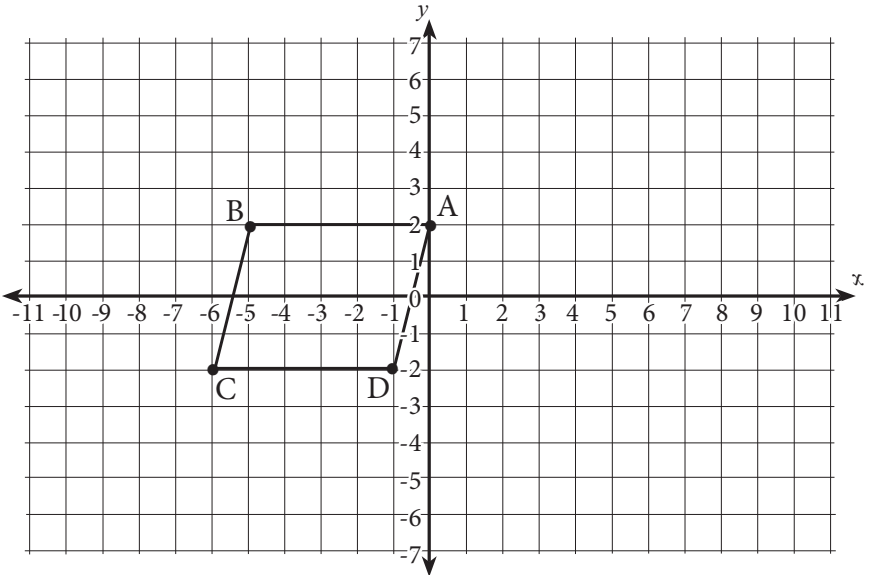
26. Determine whether the accompanying triangles are congruent. Justify your response.



Test 1

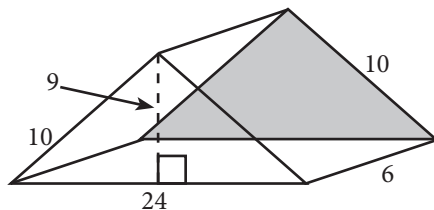
27. The coordinate plane below contains the sketch of the plans for a new four sided playground represented by quadrilateral  $ABCD$ .

- a) Sketch the play area if it must be moved using the rule of  $T_{(-5, 2)}$ .
- b) Label the coordinates of the image and state its coordinates below.



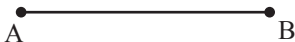
28. A container in the shape of a sphere with a diameter of 20 cm is designed to hold gourmet ice cream. What is the volume of ice cream that can held by the container? Round your answer to the *nearest whole number*.

29. Find the surface area of the triangular prism pictured below.

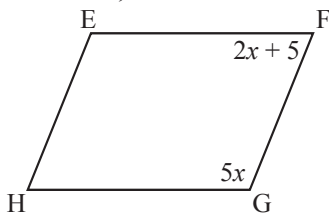


## Test 1

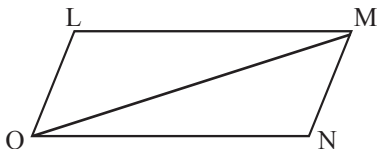
30. Use a compass and straightedge to construct a perpendicular bisector.  
[Leave all construction marks.]



31. Given parallelogram  $EFGH$ , find  $m\angle FGH$ .



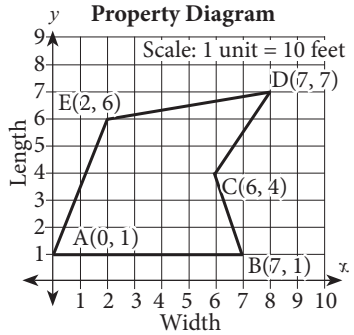
32.  $LMNO$  is a parallelogram.  $\overline{MO}$  is the diagonal of  $LMNO$ . Use congruent triangles to prove that its opposite sides are congruent.



## GEOMETRY

## Test 1

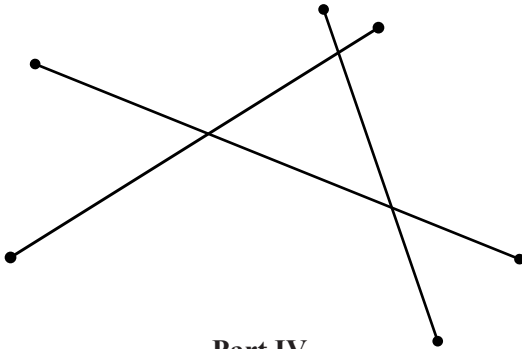
35. The Terry Fencing Company has been asked to give an estimate for the cost of enclosing a yard, in the shape of polygon  $ABCDE$ , with a privacy fence. The yard is drawn to scale in the accompanying diagram. The fence costs \$9.95 per linear foot.



a) Determine the amount of fencing to the nearest linear foot, needed to enclose this property on all sides.

b) Using your answer from part a, what will the fencing for this project cost?

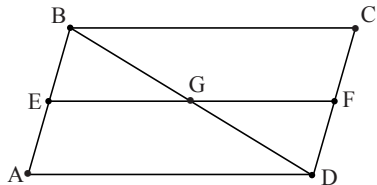
36. Let  $A$ ,  $B$ , and  $C$  be the intersections of three major hiking trails at Camp Verde. Joe wants to place a restroom that is equidistant from the intersection of the three trails shown to the right. Determine the location of the restroom using constructions. [Leave all construction marks.]



## Part IV

Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. A correct numerical answer with no work shown will receive only 1 credit. The answer should be written in pen, except for graphs and drawings, which should be done in pencil. [6]

37. Given: parallelogram  $ABCD$ ,  $\overline{EF}$  bisects  $\overline{AB}$  at  $E$ ,  $\overline{EF}$  bisects  $\overline{CD}$  at  $F$ .  
Prove That:  $\overline{EG} \cong \overline{FG}$



# **GEOMETRY COMMON CORE**

## **Correlation of Standards**



## Correlation of Standards

QUESTION	STANDARD		
	TEST 1	TEST 2	TEST 3
1	G.MG.1	G.CO.2	G.GPE.7
2	G.GMD.1	G.MG.1	G.CO.1
3	G.GMD.4	G.MD.4	G.CO.1
4	G.CO.1	G.CO.1	G.CO.9
5	G.SRT.8	G.MG.1	G.CO.1
6	G.SRT.4	G.SRT.1	G.CO.12
7	G.CO.1	G.SRT.7	G.CO.2
8	G.CO.10	G.CO.2	G.C.2
9	G.CO.9	G.C.2	G.MG.1
10	G.GPE.7	G.GPE.6	G.GMD.3
11	G.SRT.7	G.GPE.5	G.CO.7
12	G.C.2	G.GPE.1	G.GPE.6
13	G.CO.2	G.GMD.3	G.GMD.4
14	G.GPE.5	G.MG.3	G.SRT.2
15	G.CO.3	G.GMD.4	G.CO.4
16	G.GPE.7	G.GMD.1	G.CO.10
17	G.CO.13	G.CO.3	G.CO.11
18	G.MG.3	G.GMD.4	G.GPE.4
19	G.C.3	G.CO.9	G.C.2
20	G.CO.9	G.GMD.1	G.GPE.7
21	G.CO.7	G.GPE.7	G.CO.6
22	G.GPE.1	G.GMD.1	G.GPE.2
23	G.C.5	G.CO.6	G.GPE.1
24	G.CO.4	G.MG.1	G.C.1

QUESTION	STANDARD		
	TEST 4	TEST 5	TEST 6
1	G.SRT.4	G.MG.1	G.CO.7
2	G.CO.2	G.CO.8	G.SRT.2
3	G.C.1	G.GMD.3	G.MG.3
4	G.CO.5	G.CO.10	G.CO.6
5	G.SRT.2	G.CO.12	G.C.2
6	G.GPE.7	G.SRT.5	G.C.3
7	G.CO.1	C.G.1	G.CO.1
8	G.SRT.6	G.CO.11	G.SRT.8
9	G.SRT.6	G.SRT.3	G.GMD.1
10	G.C.3	G.SRT.1	G.GMD.3
11	G.CO.9	G.MG.2	G.CO.3
12	G.CO.3	G.GPE.1	G.MG.1
13	G.GPE.5	G.CO.4	G.GPE.1
14	G.GPE.4	G.CO.11	G.GMD.3
15	G.GPE.7	G.GPE.4	G.GPE.4
16	G.GPE.6	G.CO.10	G.SRT.6
17	G.CO.2	G.CO.4	G.CO.7
18	G.MG.2	G.CO.6	G.GMD.4
19	G.SRT.1	G.SRT.8	G.GPE.5
20	G.C.3	G.C.3	C.CO.13
21	G.GPE.6	G.GPE.7	G.SRT.4
22	G.GPE.2	G.GPE.7	G.CO.1
23	G.SRT.8	G.SRT.6	G.CO.11
24	G.MG.2	G.C.5	G.SRT.4

## Correlation of Standards

QUESTION	STANDARD		
	TEST 1	TEST 2	TEST 3
25	G.CO.5	G.GPE.4	G.GPE.7
26	G.CO.7	G.CO.13	G.SRT.7
27	G.CO.5	G.C.5	G.GMD.3
28	G.MD.3	G.CO.12	G.GPE.4
29	G.GMD.3	G.CO.10	G.CO.8
30	G.CO.12	G.CO.9	G.CO.12
31	G.SRT.5	G.C.3	G.CO.13
32	G.CO.11	G.GMD.3	G.MD.2
33	G.CO.6	G.GPE.4	G.SRT.1
34	G.CO.8	G.CO.10	G.SRT.8
35	G.GPE.7	G.CO.12	G.SRT.4
36	G.CO.12	G.SRT.2	G.CO.2
37	G.CO.11	G.CO.6	G.CO.5

QUESTION	STANDARD		
	TEST 4	TEST 5	TEST 6
25	G.SRT.8	G.GMD.3	G.SRT.5
26	G.CO.11	G.CO.10	G.CO.9
27	G.CO.13	G.GPE.4	C.CO.13
28	G.CO.12	G.GMD.3	G.GPE.6
29	G.CO.6	G.CO.9	G.CO.5
30	G.MG.3	G.CO.2	G.GPE.7
31	G.CO.3	G.SRT.5	G.SRT.2
32	G.GMD.4	G.GPE.7	G.GPE.7
33	G.GMD.3	G.CO.12	G.MG.2
34	G.CO.6	G.SRT.6	G.CO.5
35	G.GPE.7	G.CO.3	G.CO.11
36	G.CO.12	G.CO.13	G.CO.4
37	G.GPE.1	G.CO.7	G.CO.9

## Correlation of Standards

STANDARD	TEST 1	TEST 2	TEST 3
G.C.1			24
G.C.2	9, 12	8, 19	
G.C.3	19	31	
G.C.4			
G.C.5	23	27	
G.CO.1	4, 7	4	2, 3, 5
G.CO.2	13	1, 8	7, 36
G.CO.3	15	17	
G.CO.4	24		15
G.CO.5	25, 27		37
G.CO.6	33	23, 37	21
G.CO.7	21, 26		11
G.CO.8	34		29
G.CO.9	9, 20	19, 30	4
G.CO.10	8	29, 34	16
G.CO.11	32, 37		17
G.CO.12	30, 36	28, 35	6, 30
G.CO.13	17	26	31
G.GMD.1	2	16, 20, 22	
G.GMD.3	29	13, 32	10, 27
G.GMD.4	3, 18	15	13
G.GPE.1	22	12	23
G.GPE.2			22
G.GPE.3			
G.GPE.4		25, 33	18, 28

STANDARD	TEST 4	TEST 5	TEST 6
G.C.1	3	7	
G.C.2			5
G.C.3	10, 20	20	6
G.C.4			
G.C.5		24	
G.CO.1	7		7, 22
G.CO.2	2, 17	30	
G.CO.3	12, 31	35	11
G.CO.4		13, 17	36
G.CO.5	4		29, 34, 37
G.CO.6	29, 34	18	4
G.CO.7		37	1, 17
G.CO.8		2	
G.CO.9	11	29	26, 37
G.CO.10		4, 16, 26	
G.CO.11	26	8, 14	23, 35
G.CO.12	28, 36	5, 33	
G.CO.13	27	36	20, 27
G.GMD.1			9
G.GMD.3	33	3, 25, 28	10, 14
G.GMD.4	32		18
G.GPE.1	37	12	
G.GPE.2	22		
G.GPE.3			
G.GPE.4	15	15, 27	15

## Correlation of Standards

STANDARD	TEST 1	TEST 2	TEST 3
G.GPE.5		11	
G.GPE.6		10	12
G.GPE.7	1, 16, 35	21	1, 20, 25
G.MD.2			32
G.MD.3	28		
G.MD.4	3		
G.MG.1	1	2, 5, 24	9
G.MG.2			
G.MG.3	18	14	
G.PE.5	14		
G.SRT.1		6	33
G.SRT.2		36	14
G.SRT.3			
G.SRT.4	6		35
G.SRT.5	31		
G.SRT.6			
G.SRT.7	11	7	26
G.SRT.8	5		34

## Correlation of Standards

STANDARD	TEST 4	TEST 5	TEST 6
G.GPE.5	13		19
G.GPE.6	16, 21		28
G.GPE.7	6, 15, 7	21, 22, 32	30
G.MD.2			
G.MD.3			
G.MD.4			
G.MG.1		1	12
G.MG.2	18, 24	11	2, 33
G.MG.3	30		3
G.PE.5			
G.SRT.1	19	10	31
G.SRT.2	5		
G.SRT.3		9	
G.SRT.4	1		21, 24
G.SRT.5		6, 31	25
G.SRT.6	8, 9	23, 34	16
G.SRT.7			
G.SRT.8	23	19, 25	8