

Math Relays 2017

Geometry

No calculators allowed on this test

Shade the letter of the correct answer on the answer sheet.

In 1-4, the set of points in the plane equidistant from:

(a) point, (b) line, (c) parabola (d) ellipse, (e) none of these

1. three points not lying on a straight line
2. a point
3. two distinct points
4. a straight line and a point outside the line

In 5-8 name the figure with the sides:

(a) right triangle, (b) obtuse triangle, (c) acute triangle (d) isosceles triangle, (e) none of these

5. 2, 2, 4
6. 3, 5, 7
7. 5, 6, 7
8. 5, 12, 13

In 9-13 name the geometric figure in the three dimensional space:

(a) line, (b) plane, (c) sphere, (d) cylinder, (e) none of these

9. three points not lying on a plane
10. three points lying in a plane but not lying on a line
11. a point
12. two distinct points
13. a line

In 14-18, if the diameter of the figure (that is, the most distanced points of it) is 2, then the (surface) area is:

- (a) $4\sqrt{3}$, (b) 2, (c) $\sqrt{3}$, (d) 8, (e) none of these

14. square

15. equilateral triangle

16. sphere

17. tetrahedron

18. cube

In 19-24 find the maximum number of intersecting points of:

- (a) six, (b) as many as one wants but finitely many, (c) four, (d) sixteen, (e) none of these

19. parabola and hyperbola

20. circle and the graph of $y = \sin x$

21. tetrahedron and a circle

22. two triangles

23. octagon and a circle

24. Hawaiian earring (that is, the union circles centered at $(0, \frac{1}{n})$ of radius $\frac{1}{n}$) and line