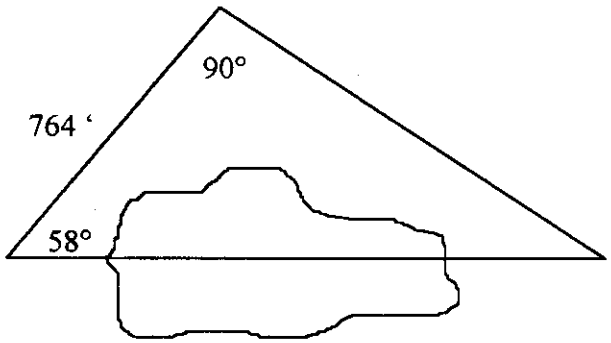
NOTA means "**none of these answers.**"

A table of trigonometric functions appears at the end of the test.

1. The amount of gas consumed per hour by a certain passenger vehicle is directly proportional to the square of the speed of the vehicle. If that certain passenger vehicle consumes 4 gallons of gas if driven at 60 miles per hour, how many gallons of gas would it consume if the vehicle was driven 40 miles per hour?

A. $2\frac{2}{3}$ B. $1\frac{7}{9}$ C. $1\frac{9}{10}$ D. $3\frac{1}{3}$ E. NOTA

2. A surveyor wishes to measure the distance across a small lake. He stands 100 feet back from the edge of the lake and then measures the distance 764 feet at an angle of 58° from the line he wishes to measure along across the lake. From that point if he turns 90° he can sight in on a point 200 feet along the line of measure on the far side of the lake. To the nearest 10 feet, how far is it across the lake?



A. 1740 feet B. 1260 feet C. 1340 feet D. 1440 feet E. NOTA

3. At a dinner party for 12, only the host and hostess must sit next to each other at a round table. How many ways can the people be seated at that table?

A. 3,628,800 B. 39,916,800 C. 79,833,600 D. 7,257,600 E. NOTA

4. Marvin wants to place a two foot wooden border around his garden. If the dimensions of the region with the border is 36 feet x 60 feet, how many square feet of wood (assuming no excess) does he need to build his border?

A. 352 B. 368 C. 384 D. 402 E. NOTA

5. A company wishes to make a cylindrical container that will hold no less than 150 cubic feet. If the height of the container must be twice the radius of the base, what is the minimum height needed if the cylinder is to be made using integral units for the radius and height?

A. 6 feet B. 8 feet C. 10 feet D. 12 feet E. NOTA

6. A secret agent must hand deliver a package from Washington to Orlando as soon as possible. All flights from Washington to Orlando pass through Atlanta. If there are 6 airlines between Washington and Atlanta and 5 different airlines between Atlanta and Orlando, how many possible routes are there for the secret agent to travel from Washington to Orlando and return without taking the same airline?

A. 20 routes B. 50 routes C. 600 routes D. 900 routes E. NOTA

7. Filling the town's pool takes four hours using the main fill pipe. Using the main fill pipe and the auxiliary fill pipe it takes 3 hours to fill the pool. If it took 6 hours to fill the pool when the drain was accidentally left open and both fill pipes were used, how long does it normally take to drain the pool?

A. 4 hours B. 5 hours C. 6 hours D. 8 hours E. NOTA

8. A survey of 47 people pet owners produced the following information, 25 people own dogs, 25 people own fish, 20 people own cats, 11 people own dogs and fish, 10 people own dogs and cats, and 8 people own fish and cats. How many people own all three pets?

A. 9 people B. 8 people C. 7 people D. 6 people E. NOTA

9. A ball is dropped from a height of 160 meters. If the ball rebounds at three-fifths of the height it has fallen, how far will the ball travel before it stops bouncing?

A. 160 meters B. 320 meters C. 640 meters D. 800 meters E. NOTA

10. A man on the top of a cliff looks at a plane with angle of elevation of 20°. At the same time a woman facing the cliff looks at the plane with an angle of elevation of 70°. The man then looks down to with an angle of depression of 30° to see the woman. If the plane is flying at an altitude of 10,000 feet, to the nearest 100 feet, how far is the man from the woman? (Straight line distance. Consider the heights on the man and woman as 0.)

A. 13,100 feet B. 12,000 feet C. 11,500 feet D. 10,600 feet E. NOTA

11. A cylindrical tree with a diameter of two meters with its bark removed is cut down to form cubes. What is the length of an edge of the largest possible cube that can be made?

A. $2\sqrt{2}$ meters B. 2 meters C. $\sqrt{2}$ meters

D. 1 meter E. NOTA

12. A tire with a radius of 15 inches, is driven at 10 mph (its linear velocity). What is the angular velocity of the tire (speed at which it is rotating) in radians per hour?

A. 42,240 radians/hr B. 633,600 radians/hr C. 9,504,000 radians/hr

D. 150 radians/hr E. NOTA

13. A carpenter is building a walkway over a garden pool that is shaped like a parallelogram. If the walkway is to span the pool above the shortest diagonal, find the length of that diagonal, if the sides of the pool are 12 meters and 16 meters with one angle of the parallelogram with a measure of 120°.

A. $4\sqrt{13}$ meters B. $11\sqrt{2}$ meters C. $6\sqrt{7}$ meters

D. $5\sqrt{11}$ meters E. NOTA

14. A ship leaves port and sails 200 km with a heading of 120°, it then changes its heading to 45° and sails 120 km. What is its bearing from its original starting point? (Give your answer to the nearest degree.)

A. 27° B. 43° C. 67° D. 93° E. NOTA

15. One of the corner sections of a football stadium has one seat in the first row, three seats in the second row, five seats in the third row, and so on. If this section of the stadium will hold 1600 people when full with one person per seat, how many people can sit in the last row, one person per seat?

A. 79 people B. 101 people C. 131 people D. 159 people E. NOTA

16. An small animal preserve has 68 trees, no three of which lie in a straight line. In order to allow the squirrels to scamper between the trees how many pieces of rope will be necessary to connect each pair of trees? (Note one segment connects two trees only.)

A. 4624 pieces B. 4556 pieces C. 2312 pieces D. 2278 pieces E. NOTA

17. A family has been renting an apartment for the past five years. If the first year, the rent was $500.00 a month, and the lease agreement called for a 10% increase each year, what is the total amount that the family paid in rent over the last five years?

A. $33,000.00 B. $33,480.80 C. $36,630.60 D. $39,840.40 E. NOTA

18. If all plems are shems and all shems are clems, then which of the following statements is **NOT** a true statement?

A. If a glem is a clem, then it is a plem.

B. If a glem is a plem, then it is a shem.

C. If a glem is a shem, then it is a clem.

D. If a glem is a plem, then it is a clem.

E. NOTA

19. If the hands of an analog clock are extended to divide the face of a clock into sectors. Find the area of the smaller sector given that the radius of the clock is 4 inches, and the time is 1:48.

A. $\frac{16\pi}{5}$ square inches B. $\frac{24\pi}{5}$ square inches C. $\frac{28\pi}{5}$ square inches

D. $\frac{32\pi}{5}$ square inches E. NOTA

20. In constructing a structure with multiple rooms, the maximum number of rooms that can be constructed with an odd number of entrances (or exits) that would allow a person to walk throughout the structure without having to repeat a portal (entrance or exit) is:

A. 1 B. 2 C. 3

D. There is no limit. E. NOTA

21. Frank is building a fence along the back of his yard. He has 49 boards to use for vertical slats to run along the back between the two end posts. If each board's center is equally spaced from the next, and the back yard fence will be 125 feet long, how many feet from the starting end will the 19th board's center be nailed?

A. 19 feet B. 20 feet C. 37 feet D. 48 feet E. NOTA

22. A ball is thrown into the air. Find the maximum height that the ball reached if the path of the ball matched the function equation: $f(x) = -\frac{4}{25}x^2 + \frac{16}{25}x + \frac{384}{25}$.

A. 12 feet B. 16 feet C. 25 feet D. 60 feet E. NOTA

23. A master carpenter and an apprentice can, working together, build a cabinet in six hours. The apprentice would take twice as long working alone as the master carpenter would take working alone. How long would it take the apprentice, working alone, to build a cabinet?

A. 6 hours B. 9 hours C. 15 hours D. 18 hours E. NOTA

24. A family has eight children. Five of the children are teenagers and three are under ten. When leaving the children alone the parents decided that there must be at least three teenagers at all times and at most, two children under ten. How many different groupings using these guidelines can be made?

A. 15 B. 44 C. 112 D. 152 E. NOTA

25. A car leaves Miami traveling to Orlando, 206 miles away, at 60 miles per hour. One-half hour after it leaves, a car leave Orlando traveling to Miami over the same route, but at 50 miles per hour. How far from Miami will the two cars pass each other? (Assume constant speeds.)

A. 110 miles B. 118 miles C. 126 miles D. 134 miles E. NOTA

26. What are the odds of throwing a seven with a fair pair of dice?

A. 1 to 5 B. 1 to 6 C. 5 to 36 D. 4 to 9 E. NOTA

27. What is the probability that a student, only guessing, on a ten question true-false test, will have at least 7 problems right if that student answers all ten questions?

A. $\frac{11}{64}$ B. $\frac{175}{1024}$ C. $\frac{7}{10}$ D. $\frac{4}{5}$ E. NOTA

28. A fireman sets a ladder, that is 36 feet long, against the side of a house. If the ladder makes an angle of elevation of 75° with the ground, how far up the side of the house will it reach? (Round your answer to the nearest foot.)

A. 33 feet B. 34 feet C. 35 feet D. 36 feet E. NOTA

29. Find the coefficient of the fourth term in the expansion of $(x - 2y)^8$.

A. 56 B. – 56 C. 336 D. 448 E. NOTA

30. Find the area of the triangle with vertices (3, 4), (–2, 5), and (7, – 1).

A. 8.5 square units B. 10.5 square units C. 12.5 square units

D. 14.5 square units E. NOTA