WINSTON CHURCHILL MIDDLE SCHOOL

MATH CONTEST TEAM

TRYOUT TEST

TEST #1 of 4

25 QUESTIONS (#16 – #40)

15 MINUTES

FIRST NAME: _____

LAST NAME: _____

GRADE LEVEL: _____

	Answers
16. Roger Maris hit 61 home runs in 1961. If Maris played in 162 games that year, then, of the following, the average number of home runs Maris hit per game would be closest to A) 0.03 B) 0.38 C) 2.66 D) 32.15	16.
17. $(2\times22\times40) - (2\times22\times39) =$ A) 22 B) 39 C) 40 D) 44	17.
18. $\frac{98}{76 \times 54} =$ A) $\frac{0.98}{7.6 \times 5.4}$ B) $\frac{0.98}{0.76 \times 0.54}$ C) $\frac{9.8}{0.76 \times 54}$ D) $\frac{9.8}{0.76 \times 5.4}$	18.
19. 4 hours 45 minutes before 1 P.M. is A) 5:45 A.M. B) 8:15 A.M. C) 8:45 A.M. D) 9:15 A.M.	19.
20. 100% of 100% = A) 1 B) 2 C) 200 D) 10000	20.
21. If p is a prime number, which of the following could also be a prime number? A) $p + 7$ B) $p + 2$ C) $p + p$ D) $p\times p$	21.
22. When $\frac{2}{3}$ is divided by 0.33333, the quotient most nearly equals A) $\frac{2}{9}$ B) $\frac{1}{9}$ C) 1 D) 2	22.
23. $1989 - 1989\frac{1}{2} =$ A) $\frac{1}{2}$ B) 0 C) $-\frac{1}{2}$ D) $-1\frac{1}{2}$	23.
24. $\frac{10^8 - 1}{101} =$ A) 9999 B) 90909 C) 990099 D) 909090	24.
25. Two CD's and three cassettes cost \$42. If 1 CD costs twice as much as 1 cassette, then the cost of 1 CD and 1 cassette is A) \$12 B) \$15 C) \$16 D) \$18	25.
26. Which is equal to one-half of 1%? A) 0.5 B) 0.05 C) 0.005 D) 0.0005	26.
27. If a *left angle* were defined as the supplement of a right angle, then the measure of a *left angle* would be A) 0° B) 45° C) 90° D) 180°	27.
28. 2 m - 2 cm = A) 1.98 m B) 198 m C) 1.8 m D) 18 m	28.
29. Mom complains she has 1 million things to do. If she takes 5 minutes to do each thing, she will be done in ? hours. A) 120000 B) 200000 C) $66666\frac{2}{3}$ D) $83333\frac{1}{3}$	29.

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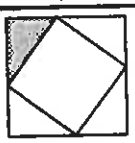
Answers

30. Find the missing number: $\frac{1.21}{1.1} = \frac{1.1}{?}$ — Answers: 30.

A) 1 B) 1.1 C) 10 D) 11

31. The larger square shown at the right has a perimeter of 56, and the smaller square has a perimeter of 40. What is the area of the shaded region? — Answers: 31.



A) 4 B) 16 C) 20 D) 24

32. If I multiply a certain number by 100 and then add 2, the result is 1. What is this certain number? — Answers: 32.

A) −1.00 B) −0.01 C) 0.01 D) 0.03

33. If $5x = x$, then $x =$ — Answers: 33.

A) 0 B) 1 C) $\frac{1}{5}$ D) 5

34. Of the following, which has the greatest value? — Answers: 34.

A) $\frac{\pi}{2}$ B) $\frac{\pi}{2}\times\frac{\pi}{3}$ C) $\frac{\pi}{2}\times\frac{\pi}{3}\times\frac{\pi}{4}$ D) $\frac{\pi}{3}\times\frac{\pi}{4}\times\frac{\pi}{5}$

35. The number 10 is expressible as a sum of two powers of 2; that is, $10 = 2^a + 2^b$, where a and b are whole numbers. Find $a + b$. — Answers: 35.

A) 3 B) 4 C) 5 D) 6

36. A propeller 4 m long is spinning so that a point 1 m from the center is moving at 900 m/sec. How fast is the movement of a point 2 m from the center? — Answers: 36.

A) 900 m/sec B) 1800 m/sec C) 2700 m/sec D) 3600 m/sec

37. A number is rounded to the nearest whole number. The original number is then rounded to the nearest ten. The difference between the 2 new numbers formed *cannot* be — Answers: 37.

A) 3 B) 4 C) 5 D) 6

38. The area of a square is 5. If each side of the square is tripled, the area of the new square would be — Answers: 38.

A) 8 B) 15 C) 45 D) 225

39. A 2 by 8 rectangle and a 3 by 7 rectangle overlap. Their common region is parallelogram P. No vertex of either rectangle is also a vertex of P. Find the least possible area of P. — Answers: 39.

A) 2 B) 4 C) 6 D) 14

40. The sum of the first 100 odd positive numbers is 100^2. The sum of the first 100 even positive numbers is — Answers: 40.

A) 100^2 B) $100^2 + 1$ C) $100^2 + 50$ D) $100^2 + 100$

The end of the contest ✍ **8**

WINSTON CHURCHILL MIDDLE SCHOOL

MATH CONTEST TEAM

TRYOUT TEST

TEST #2 of 4

10 QUESTIONS

15 MINUTES

FIRST NAME: _____

LAST NAME: _____

GRADE LEVEL: _____

ANSWERS

In this multiplication example, different letters represent different digits. What digit does H represent in the 3-digit number AHA?

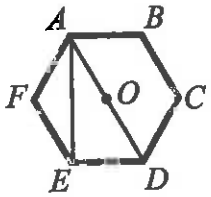
$$\begin{array}{r} AHA \\ \times \quad A \\ \hline TADA \end{array}$$

Express as a single number:

$$(-2) + (-2)(-2) + (-2)(-2)(-2) + (-2)(-2)(-2)(-2) + (-2)(-2)(-2)(-2)(-2)$$

9 apes weigh as much as 4 bears. 8 bears weigh as much as 15 cougars. 10 cougars weigh as much as 27 deer. How many deer weigh the same as 4 apes?
(Note: In this problem, all members of each species weigh the same.)

ABCDEF is a regular hexagon whose center is at point *O*. The area of triangle *AED* is 12 sq cm. What is the area of hexagon *ABCDEF*, in sq cm?
(Note: A hexagon is regular if all 6 sides are congruent and all 6 angles are congruent.)



If $5^{18} \times 2^{20}$ is multiplied out, what is the leading digit of the product?
(Note: The leading digit of a number is the digit in the leftmost position.)

ANSWERS

How many three-digit numbers satisfy all of the following?

- The sum of the tens digit and the units digit is 9;
- The number is even; and
- The number is a multiple of 3.

Suppose $A \triangleright B$ means $\frac{A+B}{A-B}$, where A and B represent two different numbers. What is the value of $\frac{3 \triangleright 5}{5 \triangleright 3}$?

As shown, each of four congruent circles just touches two other circles and two sides of the outer square. The centers of the four circles are connected to form the inner square. If the area of the outer square is 100 sq cm, what is the area of the inner square, in sq cm?

In Park School's 8th grade, 33 students like volleyball, 34 like softball, 39 like basketball, 20 like volleyball and softball, 10 like volleyball and basketball, 8 like softball and basketball, 3 like all three sports, and 12 like none of these sports. How many students are in Park School's 8th grade?

If a proper fraction in lowest terms is subtracted from its reciprocal, the difference is $\frac{77}{18}$. What is the proper fraction?

WINSTON CHURCHILL MIDDLE SCHOOL

MATH CONTEST TEAM

TRYOUT TEST

TEST #3 of 4

11 QUESTIONS

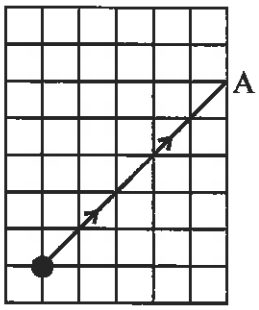
15 MINUTES

FIRST NAME: _____

LAST NAME: _____

GRADE LEVEL: _____

15. A ball is shot from the lower left part of the table along a path of 45 degrees, as shown. After contact with a side, it continues along a path that is a reflection of the path prior to contact. The line of reflection is the line perpendicular to the side of the table the ball hit, at the point of contact. The first point of contact is labeled A. After initially shot, how many times will the ball touch a side of the table before it reaches a corner of the table?



15. _____

16. A positive multiple of 45 less than 1000 is randomly selected. What is the probability that it is a two-digit integer? Express your answer as a common fraction.

16. _____

17. What is the sum of the tens digit and the units digit in the decimal representation of 9^{2004}?

17. _____

18. Forty-three percent of Americans have Type A molecules in their blood, 15% have type B molecules, and 46% have neither Type A nor Type B molecules. What percent of Americans have both Type A and Type B molecules in their blood?

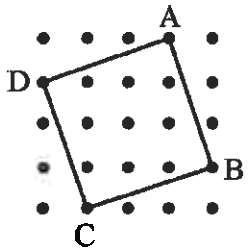
18. _____

19. The points (x, y) represented in this table lie on a straight line. The point $(13, q)$ lies on the same line. What is the value of $p+q$? Express your answer as a decimal to the nearest tenth.

x	y
2	−5
p	−14
$p+2$	−17

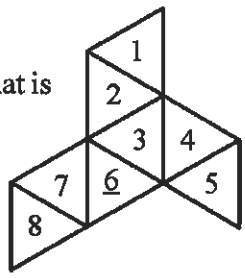
19. _____

20. On the 5 by 5 square grid below, each dot is 1 cm from its nearest horizontal and vertical neighbors. What is the product of the value of the area of square ABCD (in cm^2) and the value of the perimeter of square ABCD (in cm)? Express your answer in simplest radical form.



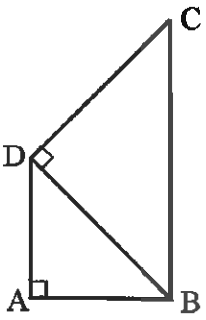
20. _____

21. This net is folded into a regular octahedron. What is the sum of the numbers on the triangular faces sharing an edge with the face with a "1" on it?



21. _____

22. Each triangle in this figure is an isosceles right triangle. The length of $\overline{BC}$ is 2 units. What is the number of units in the perimeter of quadrilateral ABCD? Express your answer in simplest radical form.



22. _____

23. Of the five points (3, 10), (6, 20), (12, 35), (18, 40) and (20, 50), what is the sum of the x-coordinates of the points that lie in the region above the line $y = 2x + 7$ in the coordinate plane?

23. _____

24. The terms $x, x + 2, x + 4, \ldots, x + 2n$ form an arithmetic sequence, with x an integer. If each term of the sequence is cubed, the sum of the cubes is -1197. What is the value of n if $n > 3$?

24. _____

25. The set $\{5, 8, 10, 18, 19, 28, 30, x\}$ has eight members. The arithmetic mean of the set's members is 4.5 less than x. What is the value of x ?

25. _____

WINSTON CHURCHILL MIDDLE SCHOOL

MATH CONTEST TEAM

TRYOUT TEST

TEST #4 of 4

12 QUESTIONS

15 MINUTES

FIRST NAME: _____

LAST NAME: _____

GRADE LEVEL: _____

ANSWER

Three students, with different names, line up single file. What is the probability that they are in alphabetical order from front-to-back?

(A) $\frac{1}{12}$ (B) $\frac{1}{9}$ (C) $\frac{1}{6}$ (D) $\frac{1}{3}$ (E) $\frac{2}{3}$

What fraction of this square region is shaded? Stripes are equal in width, and the figure is drawn to scale.

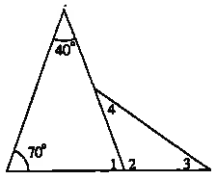
(A) $\frac{5}{12}$ (B) $\frac{1}{2}$ (C) $\frac{7}{12}$ (D) $\frac{2}{3}$ (E) $\frac{5}{6}$

Let [N] mean the number of whole number divisors of N. For example, [3] = 2, because 3 has two divisors, 1 and 3. Find the value of

[11] x [20]

(A) 6 (B) 8 (C) 12 (D) 16 (E) 24

$\angle 1 + \angle 2 = 180°$
$\angle 3 = \angle 4$
Find $\angle 4$



(A) 20° (B) 25° (C) 30° (D) 35° (E) 40°

Three bags of jelly beans contain 26, 28, and 30 beans. The ratios of yellow beans to all beans in each of these bags are 50%, 25%, and 20%, respectively. All three bags of candy are dumped into one bowl. Which of the following is closest to the ratio of yellow jelly beans to all beans in the bowl?

(A) 31% (B) 32% (C) 33% (D) 35% (E) 95%

There is a set of five positive integers whose average (mean) is 5, whose median is 5, and whose only mode is 8. What is the difference between the largest and smallest integers in the set?

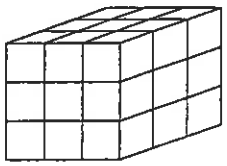
(A) 3 (B) 5 (C) 6 (D) 7 (E) 8

ANSWER

A pair of 8-sided dice have sides numbered 1 through 8. Each side has the same probability (chance) of landing face up. The probability that the product of the two numbers on the sides that land face-up exceeds 36 is

(A) $\frac{5}{32}$ (B) $\frac{11}{64}$ (C) $\frac{3}{16}$ (D) $\frac{1}{4}$ (E) $\frac{1}{2}$

Each corner cube is removed from this 3 cm x 3 cm x 3 cm cube. The surface area of the remaining figure is



(A) 19 sq.cm (B) 24 sq.cm (C) 30 sq.cm (D) 54 sq.cm (E) 72 sq.cm

A two-inch cube (2x2x2) of silver weighs 3 pounds and is worth $200. How much is a three-inch cube of silver worth?

(A) $300 (B) $375 (C) $450 (D) $560 (E) $675

There are positive integers that have these properties:

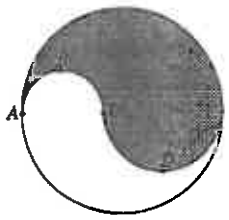
I. the sum of the squares of their digits is 50, and

II. each digit is larger than the one to its left.

The product of the digits of the largest integer with both properties is

(A) 7 (B) 25 (C) 36 (D) 48 (E) 60

Diameter ACE is divided at C in the ratio 2:3. The two semicircles, ABC and CDE, divide the circular region into an upper (shaded) region and a lower region. The ratio of the area of the upper region to that of the lower region is



(A) 2:3 (B) 1:1 (C) 3:2 (D) 9:4 (E) 5:2

All of the even numbers from 2 to 98 inclusive, except those ending in 0, are multiplied together. What is the rightmost digit (the units digit) of the product?

(A) 0 (B) 2 (C) 4 (D) 6 (E) 8