

8. A Susan B. Anthony dollar has 11 sides. How many diagonals can be drawn on one face of such a coin?
- (A) 13 (B) 10 (C) 44 (D) 88 (E) none of these [8] _____
9. If A and B are two sets each with 25 elements, the number of elements in $A \cup B$ is:
- (A) 25 (B) 50 (C) 37 (D) 0 (E) depends on the number in $A \cap B$. [9] _____
10. Two rectangular shipping boxes have dimensions $4 \times 6 \times h$ and $8 \times 2 \times (2h - 1)$, respectively. If the volumes of the two boxes are equal, $h =$
- (A) $1/8$ (B) 2 (C) $1/5$ (D) 1 (E) 4 [10] _____

WCTM MATHEMATICS CONTEST, 2000

Test 2

NAME: _____

CLASS 7th & 8th Grade

SCHOOL: _____

SCORING: 20 points for each correct answer, -5 for each wrong answer.

1. A primitive tribe has been discovered which uses a number system much like our base 10 system. Anthropologists have determined that $0 = \emptyset$, $1 = |$, $2 = <$, $3 = \triangle$, $4 = \square$ and $5 = |\emptyset$. So $\triangle\square + < \square =$

- (A) $|\emptyset\triangle$ (B) $||\triangle$ (C) $|<\square$ (D) $||\square$ (E) none of these [1] _____

2. If $49^x = 7$ and $5^{(x+y)} = 625$, then $y =$

- (A) $7/2$ (B) 2 (C) 3 (D) $5/2$ (E) $9/2$ [2] _____

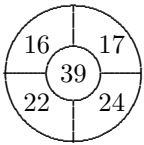
3. David was supposed to multiply a number by 6 and then subtract 5. Instead, he divided by 6 and added 5. His answer was 20. The correct answer is:

- (A) 540 (B) 535 (C) 125 (D) 120 (E) 444 [3] _____

4. Using a pan balance scale, one brick balances with $3/4$ of a brick plus a $1/2$ pound weight. The brick weighs:

- (A) 1 pound (B) 2 pounds (C) $1/2$ pound (D) $1/4$ pound (E) $3/4$ pound [4] _____

5.



Felix shoots all his arrows at the target and scores exactly 100 points. All his arrows hit the target. The smallest possible number of shots fired is:

- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7 [5] _____

6. $(5x^3y^2)(-5x^2y^3) =$

- (A) $-25x^3y^6$ (B) $-25x^5y^5$ (C) $-25x^6y^6$ (D) $-125x^5y^5$ (E) $125x^5y^5$ [6] _____

7. A brass statue weighs 4 pounds. A large scale model with scale 5:2 will weigh:

- (A) 5 pounds (B) 25 pounds (C) 50 pounds (D) 37.5 pounds (E) 62.5 pounds [7] _____

8. If a man 6 feet tall could walk around the earth at the equator, his head would travel how much further than his feet?

- (A) less than 6 feet (B) more than 1 mile (C) between 100 feet and 1 mile
(D) between 6 feet and 40 feet (E) cannot be determined without knowing the radius of the earth

[8] _____

9. Mr. B wrote the number 123454638459854321 on the board and claimed that the number is divisible by 9. Gerry says "No way." Mr. B, after consulting his notes, says that one digit is missing! The missing digit is:

- (A) 8, and must be on the left (B) 7, and must be on the right (C) 4, and can be anywhere
(D) 7, and can be anywhere (E) 6, and must be between 8 and 4

[9] _____

10. When 5 is added to a number the sum is the same as when the number is divided by 5. The number is:

- (A) less than -6 (B) between -6 and 0 (C) between 0 and 6
(D) greater than 6 (E) there is no such number

[10] _____

WCTM MATHEMATICS CONTEST, 2000

Test 3

NAME: _____

CLASS 7th & 8th Grade

SCHOOL: _____

SCORING: 20 points for each correct answer, -5 for each wrong answer.

1. If the difference between a/b and c/d is the same as the product of the two fractions, then

- (A) $a + c = ac$ (B) $ad + bc = ac$ (C) $ad - bc = ac$ [1] _____
 (D) $ad + bc = (ac)/bd$ (E) $ad - bc = (ac)/bd$

2. How many quarter inch cubes does it take to make a 2 inch cube?

- (A) 64 (B) 128 (C) 256 (D) 512 (E) 1024 [2] _____

3. The five pieces of chain are to be used to make a circular chain (no ends). The cost of cutting a link and welding it back together is 50 cents for each cut and for each weld. The least cost for making the circular chain is:



- (A) \$4 (B) \$3 (C) \$3.50 (D) \$5 (E) none of these [3] _____

4. A 60-yard long rope is to be cut into yard long pieces. Measuring and cutting takes 1/2 minute per cut. The total time required (in minutes) is:

- (A) 30 (B) $29\frac{1}{2}$ (C) $30\frac{1}{2}$ (D) 60 (E) none of these [4] _____

5. Johnson's cat went up a tree which was 63 feet tall. Each day the cat climbed 11 feet up and each night the cat climbed 7 feet down. Her paws touched the top of the tree on day number:

- (A) 6 (B) 16 (C) 15 (D) 14 (E) none of these [5] _____

6. Foghorn's Formula: Senator Foghorn has a problem with Fahrenheit and Celsius thermometers. He has invented a new scale, called the S thermometer. When the temperature is 32 degrees Fahrenheit $S = 20$. When it is 212 degrees Fahrenheit $S = 200$. The equation to change from F to S is given by $S = aF + b$. If F=53 degrees then S=

- (A) 43 degrees (B) 41 degrees (C) 50 degrees (D) 51 degrees (E) 53 degrees [6] _____

7. A right triangle has the two shorter sides 6 and 10 units long. The longest side is approximately:

- (A) 8 (B) 13.6 (C) 15 (D) 11.7 (E) none of these [7] _____

8. The coefficient of x^2 , when $(x^2 + x - 3)(x^2 + 2x - 1)$ is written as a polynomial is:

- (A) -2 (B) 2 (C) 0 (D) 4 (E) 3 [8] _____

9. $1/5$ of a number is subtracted from $1/8$ of the same number. The difference is 9. The number is:

- (A) 120 (B) -120 (C) 40 (D) -40 (E) 160 [9] _____

10. Today's world! You have a hospital bill for \$850. The insurance company pays 80% of the amount over \$250. You then must pay whatever is left. What percent of the total bill do you pay? (nearest whole number)

- (A) 20 (B) 44 (C) 25 (D) 29 (E) none of these [10] _____

WCTM MATHEMATICS CONTEST, 2000

Test 4

NAME: _____

CLASS 7th & 8th Grade

SCHOOL: _____

SCORING: 20 points for each correct answer, -5 for each wrong answer.

1. When $8x^3 - 6x^2 - 21x + 5$ is divided by $2x - 5$ the remainder is
 (A) 14 (B) $14x^2$ (C) 40 (D) 0 (E) none of these [1] _____

2. Which of the following pairs of numbers have their product as their least common multiple?
 (A) 12,15 (B) 76,100 (C) 18,51 (D) 26,63 (E) 45,75 [2] _____

3. $[(a + b)/c]/[(a - b)/d] =$
 (A) $(a^2 - b^2)/cd$ (B) $(a + b)/[(a - b)c]$ (C) $[(a - b)/a - b](c/d)$
 (D) $[(a + b)d]/[(a - b)c]$ (E) none of these [3] _____

4. Three liters of a 40% solution of a chemical are needed. The only solutions available are a 20% and a 50% solution. How much of the 20% solution should be mixed with the 50% solution to get the desired 3 liters of a 40% solution?
 (A) 2 liters (B) 1 liter (C) .5 liter (D) 3.5 liters (E) none of these [4] _____

5. The number of PRIME common factors of 3432 and 5148 is:
 (A) 4 (B) 3 (C) 2 (D) 1 (E) 12 [5] _____

6. Which expression is a factor of $10x^2y^2 - 5x^2y - 15x^2$?
 (A) $5xy$ (B) $5y$ (C) y^{-1} (D) $2y + 3$ (E) $2y - 3$ [6] _____

7. Which expressions are not the product of three consecutive integers?
 (1) $x^3 - x$ (2) $x^3 - 1$ (3) $x^3 + 3x^2 + 2x$ (4) $x^3 - 3x^2 + 2x$
 (A) 2,3,4 (B) 3 only (C) 4 only (D) 1 only (E) 2 only [7] _____

8. $(2x^{3/4})^4 =$
 (A) $8x^3$ (B) $16x^{19/4}$ (C) $3x^{19/4}$ (D) $16x^3$ (E) $16x$ [8] _____

9. If $2x - 3 + 4x = x + 2 - 6x$, then $x =$

- (A) $5/10$ (B) $5/11$ (C) $11/5$ (D) 2 (E) none of these [9] _____

10. Vicki notices that the price (in cents) of an item is 2 less than her street number. Also the sum of the two numbers is 2238. Her street address is:

- (A) 1120 (B) 1118 (C) 1119 (D) 1061 (E) none of these [10] _____

WCTM MATHEMATICS CONTEST, 2000

Test 5

NAME: _____

CLASS 7th & 8th Grade

SCHOOL: _____

SCORING: 20 points for each correct answer, -5 for each wrong answer.

1. How much longer does it take to travel 100 miles at 65 miles per hour than 100 miles at 75 miles per hour?

- (A) 10 minutes (B) 12.3 minutes (C) 13.0 minutes
 (D) 5.2 minutes (E) none of these

[1] _____

2. The ratio of girls to boys in the Ski Club is 6:5. There are 25 boys in the club. The total membership of the Ski Club is:

- (A) 30 (B) 40 (C) 52 (D) 55 (E) none of these

[2] _____

3. Grades for a 20-point test are listed in the top row of the table. The bottom row shows the number of students with the grade immediately above. The MEAN or AVERAGE score is:

Score	20	19	18	17	16	15	14	13	12	11	10
Students	1	2	4	0	3	4	4	2	3	1	2

- (A) 15.2 (B) 15 (C) 14.9 (D) 15.3 (E) 14.6

[3] _____

4. $2/3 - (7/8) + 4/9 =$

- (A) $143/72$ (B) $1/20$ (C) $1/72$ (D) $17/72$ (E) $-1/72$

[4] _____

5. If $(n + 1)/12 = n/10$, then $n =$

- (A) 12 (B) 9 (C) 8 (D) 6 (E) 5

[5] _____

6. Nancy has a collection of spiders (8 legs) and ants (6 legs). There are 21 heads and 142 legs. The number of ants is:

- (A) less than 6 (B) more than 5 and less than 8 (C) more than 7 and less than 10
 (D) more than 9 and less than 12 (E) none of these

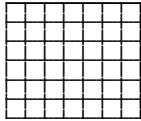
[6] _____

7. John D. Richfeller left an estate of \$3.5 million to his daughter and wife. If the ratio of what the daughter receives to what the wife receives is 2:5, the daughter received:

- (A) \$1.5 million (B) \$1.4 million (C) \$2 million (D) \$2.1 million (E) none of these [7] _____

8. John worked 49 hours last week. He earns \$6.50 per hour for the first 40 hours and 1.5 as much for the remaining hours. His total earnings for the week were:

- (A) \$406.25 (B) \$477.75 (C) \$289.25 (D) \$347.75 (E) none of these [8] _____



The grid is made of toothpicks all the same length. The total number of toothpicks is:

- (A) 97 (B) 78 (C) 80 (D) 42 (E) none of these [9] _____

10. If $a^2 + b - 2c + x = 0$ and $a = -2$, $b = 4$ and $c = -1$ then, $x =$

- (A) -10 (B) 10 (C) 2 (D) -2 (E) 6 [10] _____

Grades JHS
2000 Math Contest Exam

Exam	T1	T2	T3	T4	T5
P1	e	b	c	c	b
P2	c	a	d	d	d
P3	d	b	a	d	c
P4	c	b	b	b	d
P5	e	a	d	a	e
P6	b	b	b	e	e
P7	e	e	d	e	e
P8	c	d	a	d	d
P9	e	c	b	b	a
P10	b	a	b	a	a