6th Grade Test Randolph School Mathematics Tournament April 24, 2010

1.	If three times a numb A. 4	er is 48, then one-four B. 12	th of C.	f the number is 16	D.	30
2.	$2^5 + 2^5 =$ A. 4^3	B. 4 ⁵	C.	4 ¹⁰	D.	4 ²⁵
3.	The ratio of the sum of measures of a square	of the angle measures of is	of a	triangle to the sum	of tł	ne angle
	A. 1:2	B. 2:3	C.	3:4	D.	4:3
4.	The smallest one-digi number. The product	t prime number is mul	ltipli	ied by the smallest	two-	digit prime
	A. 11	B. 22	C.	26	D.	33
5.	What number in the g must be changed (in to make the vertical a horizontal totals corr A. 1 C. 3	grid shown only one place) and ect? B. 2 D. 8		9 3 2 8 2 7 2 1 4 6 8 3 Total 25 14 16	2 1 3 5 5 13	Total 16 20 10 22
6.	Event X occurs every days. If all three even A. April 12	3 days, event Y occur nts occur on March 31 B. April 18	rs ev , the C.	very 6 days, and eve e next time they wil April 24	ent Z l occ D.	Coccurs every 8 eur together is April 30
7.	In the figure $\angle DAB$ right angles, $AD = 3$, What is the length of	and $\angle DBC$ are AB = 4, and BC = 12. segment DC ?		D		
	A. 5 C. 17	B. 13 D. 18				
8.	Which of the followin	g statements is true?		Б		C
	A. $\frac{1}{7} > \frac{1}{3}$	B. $\frac{2}{9} < \frac{1}{5}$	C.	$\frac{2}{3} > \frac{7}{10}$	D.	$\frac{5}{7} < \frac{8}{9}$
9.	Sabrina began shoppi had left was equal to A. \$5	ng with \$15. After sp two-thirds of what she B. \$6	endi hac C.	ing some money, th l spent. How much \$9	ne am 1 had D.	nount she she spent? \$10
10. The lengths of two sides of an isosceles triangle are 6 inches and 12 inches. What is the number of inches in the perimeter of the triangle?						
	A. 24	B. 30	C.	36	D.	72
11.	$26^6 =$ A. 308,915,772	B. 308,915,774	C.	308,915,776	D.	308,915,778

12.	2. A pilot flew 80 km in 8 minutes. He flew the first 4 minutes at half speed and the second 4 minutes at full speed. The full speed of the plane was						
	A. 400 km/hr	B.	600 km/hr	C.	800 km/hr	D.	1000 km/hr
13.	A gear 48 cm in diameter turns a smaller gear that is 36 cm in diameter. In the time the larger gear makes 12 revolutions, how many revolutions does the smalle gear make?					r. In the the smaller	
	A. 24	B.	16	C.	12	D.	9
14.	Toby had 28 hits in 70 times at bat. At that rate, how many hits should he have in 110 times at bat?						
	A. 40	B.	44	C.	48	D.	72
15.	50% of 50% of 50 is v A. 100%	wha B.	t percent of 50? 50%	C.	25%	D.	12.5%
16.	$\frac{2^{150}}{2^{50}} =$						
	A. 2	B.	2^{3}	C.	100	D.	2^{100}
17.	What is the sum of all A. 24	l the B.	whole number fac 36	tors C.	s of 24? 48	D.	60
18.	The second hand of a second hand travels a	circ dist	cular clock is 5 cm tance of	lon	g. In one hour, the	tip (of the
	A. $36,000 \pi$ cm	B.	$6,000 \pi$ cm	C.	25π cm	D.	10π cm
19.	Which of the followin	ng is	the average of the	oth	er three?		
	A. 2 ⁵	В.	3 ³	C.	5^{2}	D.	$2^2 \times 7$
20. A sailboat travels 12 miles east, 7 miles south, and then another 12 miles ea						es east.	
	A. 31	в.	28	C.	25	D.	18
21.	1. Given that $3x + 5y = 30$, what is the value of $\frac{x}{5} + \frac{y}{2}$?						
	A. 2	B.	5	C.	12	D.	15
22.	If $\int_{a}^{b} c = a^{2} + b^{2} - c^{2}$,	wha	t is the value of $\int_{3}^{4} 5$?			
	A. 32	B.	18	C.	4	D.	0
23 If $3r = 21$ then $21r = 2$							
	A. 3	В.	7	C.	63	D.	147

24. If you roll two fair, standard six-sided dice, what is the probability that the sum the numbers on the top faces will be at most 5?						
A. $\frac{7}{36}$	B. $\frac{2}{9}$	C. $\frac{1}{4}$	D. $\frac{5}{18}$			
25. How many in	teger divisors does 375 l	nave?				
A. 20	B. 16	C. 12	D. 8			
26. $\sqrt{1 \times 2 \times 3 \times 4}$	$\times 5 \times 6 \times 8 \times 9 \times 10 =$					
A. 720	B. 360	C. 120	D. 96			
27. What is 1220	2_3 written as a base ten r	number?				
A. 250	B. 198	C. 182	D. 155			
28. What is the d hands of a cir	egree measure of the sma cular clock at 12:12 PM	aller angle between th ?	he hour and minute			
A. 48°	B. 60 °	C. 66°	D. 72°			
29. How many d selected from	ifferent three-digit numb	ers can be made usin	g any three digits			
A. 20	B. 18	C. 16	D. 12			
30. If <i>a</i> is an odd statements al	whole number and b is bout the whole number a	any whole number, w $a^2 + ab$ is always true	hich of the following			
A. It is even	only if <i>b</i> is even.	B. It is odd or	B. It is odd only if b is even.			

C. It is odd only if *b* is odd.

B. It is odd only if b is even. D. It is always odd.

TIE-BREAKERS

- 1. A number is called an "increasing number" if each digit in the number is greater than the digit to its left. For example, 3589 is an increasing number. How many increasing numbers are there between 5000 and 10,000?
- 2. A rectangular grazing area is to be fenced off on three sides using part of a 100 meter rock wall as the fourth side. Fence posts are to be placed every 12 meters along the fence including two posts where the fence meets the rock wall. What is the fewest number of posts required to fence an area that is 36m by 60m?
- 3. There is a pair of whole numbers x and y, each greater than one and less than ten, for which $x^{y} = y^{x} + 1$. Find the value of $(x + y)^{3}$.