

**6<sup>th</sup> Grade Test**  
**Raider Math Challenge**  
**April 20, 2013**

1. Evaluate.  $(-3 + (7 - (-2 + 6))) + 7$

- A. 7                      B. 12                      C. 13                      D. 19

2. Exactly one of the following numbers is prime. Which is it?

- A. 771                      B. 773                      C. 775                      D. 777

3. Solve for  $x$ .  $4x + 13 = 37$

- A. 50                      B. 24                      C.  $\frac{25}{2}$                       D. 6

4. The perimeter of a triangle with integer side lengths is 57. What is longest possible length of one of its sides?

- A. 57                      B. 29                      C. 28                      D. 19

5.  $3^7 + 3^7 + 3^7 =$

- A.  $9^{21}$                       B.  $3^{21}$                       C.  $9^7$                       D.  $9^4$

6. A rocket's top speed is 21,120 feet per second. If it starts at top speed, how many miles will it go in five hours?

- A. 20                      B. 72,000                      C. 105,600                      D. 380,160,000

7. Find the area of a circle with diameter 40.

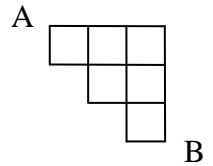
- A.  $40\pi$                       B.  $80\pi$                       C.  $400\pi$                       D.  $1600\pi$

8. How many perfect cubes are strictly between 0 and 1,000,000?

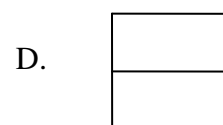
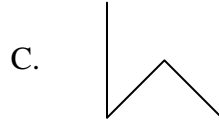
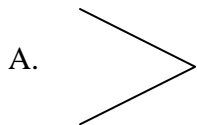
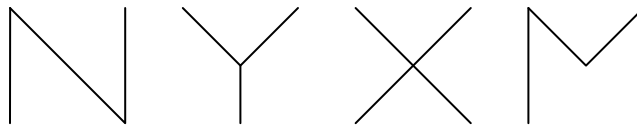
- A. 99                      B. 100                      C. 101                      D. 1,000,0000

9. Find the number of paths from A to B in the diagram to the right if you can only move down or to the right along the segments of the grid.

- A. 14                      B. 18                      C. 21                      D. 3



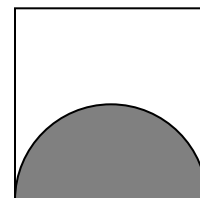
10. Which symbol comes next in the following sequence?



11. Find the value of  $x$  if  $y = 2$ ,  $z = 4$ , and  $2x + 4y - z = 10$ .

- A. 3                      B. 4                      C. 6                      D. 12

12. Grif, Caboose, and Simmons were each licking Tootsie Roll Pops. It took Grif 168 licks to get to the Tootsie Roll center of his Tootsie Roll Pop. It took Caboose 720 licks to get to the Tootsie Roll center of his Tootsie Roll Pop. On average, it took the three of them 371 licks to get to their respective Tootsie Roll centers. How many licks did it take Simmons to get to the Tootsie Roll Center of his Tootsie Roll Pop?
- A. 444                      B. 371                      C. 298                      D. 225
13. A standard 6-sided die is rolled once. If the number showing is a multiple of 3, a penny is flipped once. Otherwise, a nickel is flipped once. What is the probability that, after executing this procedure, the penny has been flipped to reveal heads?
- A.  $\frac{1}{2}$                       B.  $\frac{2}{3}$                       C.  $\frac{1}{3}$                       D.  $\frac{1}{6}$
14. Which of the following is equal to  $4!3!2!1!$  ?
- A.  $5!$                       B.  $6!$                       C.  $12 \cdot 2$                       D.  $12^2 \cdot 2$
15. What is the sum of the distinct prime factors of 360,000,000?
- A. 10                      B. 11                      C. 16                      D. 17
16. Solve for  $x$ .  $\sqrt{x+7} + 6 = 8$
- A. 2                      B. -11                      C. -3                      D. 3
17. How many diagonals can be drawn in a regular dodecagon (a twelve-sided polygon)?
- A. 12                      B. 54                      C. 108                      D. 132
18. What is the second-largest two-digit prime number?
- A. 97                      B. 95                      C. 93                      D. 91
19. Two cards are drawn randomly from a standard 52-card deck without replacement. What is the probability of drawing a red ace and then a black queen?
- A.  $\frac{1}{663}$                       B.  $\frac{1}{13}$                       C.  $\frac{1}{676}$                       D.  $\frac{103}{1326}$
20. The shaded region in the diagram is a semicircle that shares a side with a square. Which of these is closest to the area of the unshaded region?
- A. 86                      B. 157                      C. 243                      D. 262
21. For how many integer values of  $x$  is the quantity  $|2x-1|-2$  a negative number?
- A. 0                      B. 1                      C. 2                      D. 3
22. Three consecutive whole numbers add up to a three-digit palindrome (a number that reads the same forwards and backwards). The only digits in the palindrome are 3 and 0, though some of them may be repeated. What is the smallest of the three consecutive whole numbers?
- A. 101                      B. 100                      C. 110                      D. 109



20

23. The seventh term in an arithmetic sequence is 11 and the tenth term is 5. What is the first term?  
 A. -1                      B. 13                      C. 17                      D. 23
24. Nayana was born at 1:00 p.m. on Thursday, December 9, 1999. On what day of the week will she turn 630,000,000 seconds old?  
 A. Monday                      B. Tuesday                      C. Wednesday                      D. Thursday
25. In the *crazy square* to the right, each of the columns, rows, and two main diagonals adds up to the same amount. What number must go in the top right box of the crazy square?  
 A. 3                      B. 6                      C. 9                      D. 12

11	13	
1		17
	5	7

### Tie breakers

- TB1. Grambles decided to try to keep the doctor away. On the first day, she ate some apples. On the next day, she ate twice as many apples as on the first day. On the third day, she ate three times as many apples as on the second day. On the fourth day, she didn't feel too well, so she had to go to the doctor. In all, Grambles ate 54 apples. How many did she eat on the second day?
- TB2. Helga thought of a four-digit number with the following property: To divide the number by 7 you remove its hundreds digit. What is the number?
- TB3. The diagram below depicts an equilateral triangle on top of a square. What is the degree measure of  $\angle CBE$ ?

