

**2008 Middle School Math Festival****Individual Round: Prealgebra**

1. A person rolls two fair six-sided dice. What is the probability of rolling a sum for the two dice of 5?

A.  $\frac{1}{25}$

B.  $\frac{1}{3}$

C.  $\frac{1}{6}$

D.  $\frac{1}{9}$

2. Evaluate:  $|-3^3 - (-5)^2|$ .

A. 2

B. -2

C. 52

D. -52

3. For the sequence  $3, \frac{5}{2}, \sqrt{4}, 1.5, 1, \dots$ , what is the sum of the 6<sup>th</sup> and 8<sup>th</sup> terms?

A.  $\frac{1}{2}$

B. 0

C.  $-\frac{1}{2}$

D. -1

4. For the sequence  $-12, 6, -3, \frac{3}{2}, \dots$ , what is the value of the 5<sup>th</sup> term divided by the 6<sup>th</sup> term?

A.  $\frac{1}{2}$

B. -2

C.  $-\frac{1}{2}$

D. 2

5. What is the LCM of 18, 28, and 42?

A. 2

B. 42

C. 126

D. 252

6. A square has a diagonal of length  $\sqrt{6}$  mm. What is the area of the square?

A.  $3 \text{ mm}^2$

B.  $6 \text{ mm}^2$

C.  $\sqrt{3} \text{ mm}^2$

D.  $4\sqrt{3} \text{ mm}^2$

7. After five quizzes, you have an average of 88%. You have one more test and want to earn an A, which requires a 90% average. What must you score on the final test to earn an A?

A. 90

B. 98

C.) 100

D. Impossible

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8. Find the median:  $7 \left| \begin{array}{l} 0 \ 3 \ 4 \ 4 \\ 8 \ 2 \ 5 \\ 9 \ 3 \ 6 \ 7 \ 8 \end{array} \right.$  where  $7 \mid 2$  means 7.2
- A. 8.2                      B. 8.35                      C. 8.42                      D. 8.5
9. What number is 1.05% of 2100?
- A. 20                      B. 22.05                      C. 2000                      D. 2205
10. What is the slope of the line  $3x - 2y = 6$ ?
- A. -3                      B.  $-\frac{3}{2}$                       C.  $-\frac{2}{3}$                       D.  $\frac{3}{2}$
11. If  $f(x) = -\frac{1}{16}x^7 + 4$ , what is  $f(-2)$ ?
- A. -12                      B. -4                      C. 8                      D. 12
12. If  $a \# b = \frac{1}{2}a - 3b$ , what is the value of  $(4\#-2)\#(-1)$ ?
- A. 10                      B. 7                      C. 1                      D. -5
13. How many different ways can five people line up for a photo if the tallest person must stand in the middle?
- A. 4                      B. 16                      C. 24                      D. 120
14. Evaluate  $\frac{6!}{3!2!}$
- A. 720                      B. 120                      C. 60                      D. 1
15. If the odds of losing are 5 to 3, what is the probability of winning?
- A.  $\frac{3}{8}$                       B.  $\frac{5}{8}$                       C.  $\frac{3}{5}$                       D.  $\frac{5}{3}$

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16. Darnell wants to buy a new bicycle which costs \$176. He currently has \$49 saved in his local bank. He mows yards for neighbors and charges \$12 per yard. How many yards does Darnell need to mow to be able to afford the bicycle?

- A. 9 yards                      B. 11 yards                      C. 15 yards                      D. 19 yards

17. Evaluate  $z - x - y$  when  $x = -19$ ,  $y = -15$ , and  $z = 16$ .

- A. -18                      B. 12                      C. 20                      D. 50

18. During Nathan's Pop Warner 6-game football season, his team scored 31, 24, 14, 28, 21, and 14 points. How many points per game did Nathan's team average?

- A. 22.5 points                      B. 22 points                      C. 17 points                      D. 14 points

19. Fourteen less than the quotient of a number,  $x$ , and  $-7$  is  $-8$ . What is the number,  $x$ ?

- A. 154                      B. 70                      C. 56                      D. -42

20. Evaluate  $(m + n)^{-3}$  if  $m = -1$  and  $n = -5$ .

- A.  $-\frac{1}{216}$                       B.  $\frac{1}{216}$                       C. -216                      D. 216

21. Which of the following values is the smallest?

- A.  $3.7 \times 10^{-16}$                       B.  $2.8 \times 10^{-15}$                       C.  $1.44 \times 10^{-15}$                       D.  $1.5 \times 10^{-18}$

22. Evaluate  $2\frac{1}{5} \div 5\frac{1}{6}$ .

- A.  $3\frac{9}{11}$                       B.  $\frac{66}{155}$                       C.  $\frac{4}{5}$                       D.  $11\frac{11}{30}$

23. Devin can run  $1\frac{1}{2}$  miles in 10 minutes. At the same rate, how far can he run in 25 minutes?

- A. 3 miles                      B.  $3\frac{1}{2}$  miles                      C.  $3\frac{3}{4}$  miles                      D.  $4\frac{1}{2}$  miles

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24. What % of 70 is 3.5?

- A. 5%                      B. 2%                      C. 0.05%                      D. 20%

25. A computer game that normally sells for \$34.95 is on sale at an 18% discount. What is the sale price, before tax, of the game?

- A. \$6.29                      B. \$16.95                      C. \$28.66                      D. \$41.24

26. What is the solution to the following equation?  $6(d + 6) = 4(d - 6) + 2d$

- A. All real numbers    B. -5                      C. -60                      D.  $\phi$  (empty set)

27. Solve for  $x$ :  $-5 \leq \frac{x}{6}$

- A.  $x \geq 30$                       B.  $x \geq -30$                       C.  $x \leq 1$                       D.  $x \leq -30$

28. The number of millimeters in a measure varies directly as the number of inches. The table below shows conversion values between inches ( $x$ ) and millimeters ( $y$ ). Write a direct variation equation which could be used to convert inches to millimeters.

Measure in Inches	Measure in Millimeters
$x$	$y$
2	50.8
4	101.6
5	127.0

- A.  $y = 2.54x$                       B.  $y = 25.4x$                       C.  $y = 50.8x$                       D.  $y = 0.039x$

29. A television screen is 24 inches wide by 48 inches long. What is the length of the diagonal, to the nearest inch?

- A. 36 inches                      B. 48 inches                      C. 54 inches                      D. 2880 inches

30. A statue casts a 10-foot shadow. At the same time, a 6-foot man casts a 4 foot shadow. How tall is the statue?

- A. 15 feet                      B.  $6\frac{2}{3}$  feet                      C.  $2\frac{2}{3}$  feet                      D. 16 feet