

PreAlgebra Test
VHHS Math Tournament
2007

1. Which of the following is equivalent to $-5 \leq 3 - 2x < 7$?

- A. $-2 \leq x < 4$ B. $-5 < x \leq 1$ C. $-2 < x \leq 4$ D. $-5 \leq x < 1$ E. NOTA

2. Zhenya collects socks, not pairs of socks, but individual socks. She has nine orange socks, twelve blue socks, five purple socks, and two white socks. If she is blindfolded and takes out one sock at a time without replacement, how many socks must she take out to be sure that she has a pair of the same color?

- A. 3 B. 5 C. 10 D. 13 E. NOTA

3. Carol agrees to work for a full year for the payment of a car (worth a certain amount of money) and \$32,000. She quits after five months, so she receives the car and only \$4,000. How much is the car worth?

- A. \$16,000 B. \$9,000 C. \$4,000 D. \$12,000 E. NOTA

4. $8\left(\frac{n}{4} - 3\right) > n - 17$

- A. $n > 7$ B. $n < 7$ C. $n > -7$ D. $n < -7$ E. NOTA

5. How many prime numbers are less than 100?

- A. 25 B. 24 C. 23 D. 22 E. NOTA

6. Let A be 30% of 120. Let B be 120% of 30. What is the value of the ratio of A:B?

- A. $\frac{1}{2}$ B. 1 C. 2 D. 3 E. NOTA

7. In planet Krazy, 6 kurckles equals to 4 kurks. 5 kurks equals to 7 kurties. 3 kurties equals to 9 earth dollars. How many earth dollars is 3 kurckles worth?

- A. \$7.20 B. \$6.40 C. \$8.40 D. \$5.50 E. NOTA

8. A softball team has a 22 game season. If the team wants to win at least 80% of its games, then how many games must the team win if they currently have won 14 games and lost 2?

- A. 3 B. 4 C. 5 D. 6 E. NOTA

9. Max, Mary, and Murray are sitting around talking. Max figured out that in 3 years, his age will be $\frac{1}{3}$ of Murray's age. Six years ago, Mary was twice Max's age. If Murray is 30 years older than Mary, how old is Max?

- A. 15 B. 18 C. 24 D. 36 E. NOTA

10. Connie is shopping at J. Crew, and she sees this extremely cute summer dress! The dress is \$270, but she has a 30% off coupon. On this day there is also a clearance of an extra 15% off on all items. With 8% sales tax, how much did she end up paying for the dress?

- A. \$173.50 B. \$148.50 C. \$160.38 D. \$160.65 E. NOTA

11. Find x if $2x + y = 5$ and $3x + 2y = 6$.

- A. 8 B. 6 C. 4 D. -3 E. NOTA

12. Solve: $(10 + 2 - 15 \div 3 \times 6 - 5 + [21 \div (7 \times 3)])^2$

- A. 484 B. -22 C. -10 D. 100 E. NOTA

13. Evaluate: $1 - 2 + 3 - 4 + 5 - 6 + \dots - 2006 + 2007$

- A. 1 B. 2008 C. 1004 D. 1003 E. NOTA

14. The sum of two numbers is 56. One number is three times the other. What is the sum of the units digits of the two numbers?

- A. 4 B. 5 C. 6 D. 7 E. NOTA

15. Simplify: $2\sqrt{20} - 2\sqrt{45} + 3\sqrt{80}$

- A. $5\sqrt{10}$ B. $7\sqrt{7}$ C. $9\sqrt{5}$ D. $10\sqrt{5}$ E. NOTA

16. There are 102 animal feet on a farm. If there are 40 total animals on the farm and the animals consist of only chickens and pigs, how many of the animals are pigs?

- A. 29 B. 14 C. 26 D. 11 E. NOTA

17. What is the GCF of $12v^3h^2$ and $30h^6s$?

- A. $60v^3h^6s$ B. $6vh^2$ C. $6h^2$ D. $60v^3h^8s$ E. NOTA

18. Find the total surface area of a cube with edges measuring 2 centimeters.

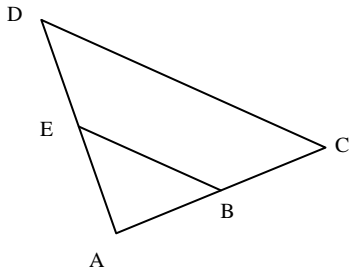
- A. 32 cm^2 B. 24 cm^2 C. 16 cm^2 D. 8 cm^2 E. NOTA

19. Consider the set of numbers below. Let A = mean, B = median, C = mode, and D = range. What is the value of $A \cdot B + C \cdot D$?

$\{23 \ 13 \ 29 \ 21 \ 11 \ 16 \ 12 \ 24 \ 31 \ 28 \ 24 \ 20\}$

- A. 931 B. 931.5 C. 942 D. 953 E. NOTA

20. In the figure below, $CD = 8$, $AD = x$, and $AE = \frac{x}{2} - 1$, and $BE = 2.4$. If $\triangle ACD$ is similar to $\triangle ABE$, find the length of side AE .



- A. $\frac{6}{5}$ B. $\frac{5}{12}$ C. $\frac{17}{6}$ D. $\frac{3}{2}$ E. NOTA

21. Consider a regular quadrilateral with an area of 48 square units. If a regular octagon has the same side length measures as that of the regular quadrilateral, what is the perimeter of the octagon?

- A. $96\sqrt{3}$ B. $64\sqrt{6}$ C. $32\sqrt{2}$ D. $96\sqrt{2}$ E. NOTA

22. What is the fraction representation of $0.\overline{25}$?

- A. $\frac{1}{4}$ B. $\frac{6}{25}$ C. $\frac{23}{90}$ D. $\frac{25}{99}$ E. NOTA

23. How many whole numbers are common divisors of both 168 and 180?

- A. 5 B. 6 C. 8 D. 12 E. NOTA

24. Let x be the solution to the proportion $\frac{x+1}{2} = \frac{2x}{5}$. What is the value of $x^2 - x$?

- A. -20 B. 20 C. -30 D. 30 E. NOTA

25. If Jimmy rolls 2 standard six-sided dice, what is the probability he obtains a sum of 7 or 11?

- A. $\frac{1}{6}$ B. $\frac{2}{9}$ C. $\frac{2}{11}$ D. $\frac{1}{4}$ E. NOTA

TB1: A number palindrome is a number that reads the same forward and backward. For example, 83338 is a palindrome. What is the eighth palindrome that numerically appears after the number 83338?

TB2: Convert 2007_8 to base 32.

TB3: Given the following values and equation:

$$\theta = (4.7)(10^{2007}) \quad x = 3476239 \quad y = (2.3)(25.7) \quad z = (\theta xy)^0$$

$$\left(\frac{\left(\frac{\sqrt{3}x^2\theta^4}{\pi^2} \right)^2 \left(\frac{e^7}{y} \right)^{-1}}{\left(\frac{e}{\sqrt[3]{y}} \right)^{-7} \left(\frac{\pi}{\sqrt[4]{17x\theta^2}} \right)^{-4}} \right)^z$$

When simplified, what holiday is this?