

KCATM 2011

Word Problems: 9th & 10th

1. All 200 tickets were sold for a particular concert. Some tickets cost \$10 apiece, and the others cost \$5 apiece. If total tickets sales were \$1750, how many of the more expensive tickets were sold?

- A. 50
- B. 75
- C. 100
- D. 150

2. In a recent survey, 14 students read at least one book outside of school each month. If this number is exactly 20% of the students surveyed. How many students were surveyed?

- A. 35
- B. 56
- C. 70
- D. 84

3. To earn a B for the semester, Linda needs an average of at least 80 on the five tests. Her average for the first four tests scores is 79. What is the minimum score she must get on the fifth test to earn a B for the semester?

- A. 84
- B. 83
- C. 82
- D. it is not possible for Linda to earn a B for the semester

4. In a class of 10 boys and 15 girls, the boys' average score on the final exam was 80 and the girls' average score was 90. What was the average score for the whole class?

- A. 84
- B. 85
- C. 86
- D. 87

5. Among travelers riding a bus, the ratio of males to females is 5:3. If there are a total of 24 travelers on the bus, how many males are there?

- A. 9
- B. 12
- C. 15
- D. 18

6. A train traveled at a rate of 90 miles per hour for x hours and then at a rate of 60 miles per hour for y hours. Which expression represents the train's average rate in miles per hour for the entire distance traveled?

- A. $\frac{540}{xy}$
- B. $\frac{90x + 60y}{x + y}$
- C. $\frac{90}{x} + \frac{60}{y}$
- D. $\frac{150}{x + y}$

7. Nine less than the number c is the same as the number d , and d less than twice c is 20. Which two equations could be used to determine the value of c and d ?

- A. $d - 9 = c$
 $d - 2c = 20$
- B. $c - 9 = d$
 $2c - d = 20$
- C. $c - 9 = d$
 $d - 2c = 20$
- D. $9 - c = d$
 $2c - d = 20$

8. A restaurant's fixed-price dinner includes an appetizer, an entrée, and dessert. If the restaurant offers 3 different types of appetizers, 5 different types of entrees, and 4 different types of desserts, how many different ways are there to order a fixed-price dinner assuming you choose all three courses?

- A. 120
- B. 60
- C. 12
- D. 5

9. How many positive integers less than 50 are multiples of 4 but not multiples of 6?

- A. 4
- B. 6
- C. 8
- D. 10

10. A box with an open top is to be constructed from a rectangular piece of cardboard with dimensions 10 inches by 21 inches by cutting out equal squares of side length x at each corner and then folding up the sides. Express the volume, V , of the box in terms of x .
- A. $V = (10 - 2x)(21 - 2x)$
 - B. $V = x(10 - x)(21 - x)$
 - C. $V = (10 - x)(21 - x)$
 - D. $V = x(10 - 2x)(21 - 2x)$
11. How long will it take for the population of a certain country to double if its annual growth rate is 4%? Round your answer to the nearest year.
- A. 1 year
 - B. 8 years
 - C. 18 years
 - D. 50 years
12. The temperature, in Fahrenheit, of a patient after receiving a medication is given by $\text{Temperature} = 0.0002t^3 - 0.013t^2 + 0.016t + 105$, where t is the number of minutes after receiving the medication. What was the patient's temperature after a half hour?
- A. $105^\circ F$
 - B. $105.3^\circ F$
 - C. $99.2^\circ F$
 - D. $98.6^\circ F$
13. From the 99 positive integers less than 100, I chose as many different numbers as I could so that no subset of my numbers had the sum of 100. If the sum of all my numbers was as large as possible, what was the smallest number I actually chose?
- A. 1
 - B. 2
 - C. 45
 - D. 50
14. The sum of the three smallest primes and one other prime is 77. What is the product of these four primes?
- A. 77
 - B. 426
 - C. 2010
 - D. 6510
15. The cost, in cents, of 8 candies is equal to the number of candies that I can buy for 98 cents. At the same cost per candy, how many cents do 14 candies cost?
- A. 3 cents
 - B. 35 cents
 - C. 49 cents
 - D. 78 cents

16. The sum of the lengths of the two legs of a right triangle is 20. What is the smallest possible length of the hypotenuse of the triangle?

- A. $20\sqrt{2}$
- B. $10\sqrt{2}$
- C. $2\sqrt{5}$
- D. $\sqrt{5}$

17. What are the ordered pairs of numbers (x,y) such that the four vertices of a parallelogram are $(0,0)$, $(3,0)$, $(4,4)$ and (x,y) ?

- A. $(-1,-4)$ and $(1,4)$
- B. $(1,4)$ and $(7,4)$
- C. $(-1,-4)$ and $(7,4)$
- D. $(-1,-4)$, $(1,4)$ and $(7,4)$

18. In a quadrilateral two angles are equal. The third angle is equal to the sum of the two equal angles. The fourth angle is 60° less than twice the sum of the other three angles. Find the measures of the largest angle.

- A. 90 degrees
- B. 120 degrees
- C. 190 degrees
- D. 220 degrees

19. A rectangle is 4 times as long as it is wide. If the length is increased by 4 inches and the width is decreased by 1 inch, the area will be 60 square inches. Which of the following is a measurement for one of the original sides?

- A. 6 inches
- B. 8 inches
- C. 16 inches
- D. 20 inches

20. A jogger started a course at an average speed of 4.5 mph. A cyclist started the same course 1 hour later at an average speed of 14 mph. How long after the jogger started did the cyclist overtake the jogger?

- A. 1.5 hours
- B. 1.2 hours
- C. 0.8 hours
- D. 1.8 hours

21. At least how many dogs do I own if more than half of the dogs I own are male, and more than 40% of the dogs I own are female

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

22. A bag of 5 apples, 7 bananas, and 3 carrots costs \$4.41; and a bag of 6 apples, 2 bananas, and 1 carrot costs \$2.37. At these same prices, how much should a bag of 3 apples, 17 bananas, and 7 carrots cost?

- A. \$5.71
- B. \$8.49
- C. \$10.21
- D. \$15.71

23. Hooke's Law states that the distance a spring stretches varies directly as the weight on the spring increases. A weight of 60 pounds stretches a spring 2.5 inches. How far will a weight of 125 pounds stretch the spring?

- A. 5.45 inches
- B. 4.79 inches
- C. 5.01 inches
- D. 5.21 inches

24. How much pure salt must be added to 220 grams of a 22% salt solution to produce a 34% salt solution?

- A. 0.36 grams
- B. 29 grams
- C. 100 grams
- D. 40 grams

25. find the amount in an account after 9 years if \$2600 was invested originally and the account earns 7.5% annual interest, compounded quarterly.

- A. \$5070
- B. \$2800
- C. \$3070
- D. \$4980