

## MU ALPHA THETA CONVENTION 1991

## WORD PROBLEMS TOPIC TEST

1. After 40 pounds of water has been evaporated from a solution of salt and water that was 10% salt, the solution that resulted was 15% salt. Find the number of pounds in the original solution.  
A. 240    B. 200    C. 160    D. 120    E. 80
  
2. Mr. Wallace made two investments. On the first investment, \$3600, he earned a 6% profit, but on the second investment, he suffered a 2% loss. If his total annual earnings from these two investments was 4% of his entire investment, find the number of dollars in the second investment.  
A. 1200    B. 1440    C. 1800    D. 3600    E. 7200
  
3. A man can do a job in 9 days and his son can do the same job in 16 days. They start working together. After 4 days the son leaves and the father finishes the job alone. How many days did the man take to finish the job alone?  
A.  $6\frac{3}{4}$     B.  $6\frac{1}{2}$     C.  $2\frac{1}{2}$     D.  $2\frac{3}{4}$     E. none of these
  
4. One alloy of copper is 20% pure copper while another is 12% pure copper. How much of each alloy must be melted together to produce 60 pounds of alloy containing 9 pounds of copper?  
A.  $24\frac{1}{2}$  lbs;  $35\frac{1}{2}$  lbs    B.  $23\frac{1}{2}$  lbs;  $36\frac{1}{2}$  lbs  
C.  $22\frac{1}{2}$  lbs;  $37\frac{1}{2}$  lbs    D.  $21\frac{1}{2}$  lbs;  $38\frac{1}{2}$  lbs  
E. none of these

5. At one time, 4 pounds of onions cost the same as 2 pounds of string beans. At the same time, 1 pound of string beans cost 3 times as much as a pound of potatoes, while 1 pound of onions cost 4 cents less than 2 pounds of potatoes. What was the total cost (without tax) of 1 pound of each of the vegetables?
- A. 44 cents    B. 45 cents    C. 46 cents    D. 47 cents  
E. none of these
6. Clarissa punched  $\frac{1}{3}$  of a set of punch cards in 2 hours. She was then joined by Doris and together they finished the set of cards in 2 more hours. How long would it have taken for Doris to do the job alone?
- A. 5    B. 6    C.  $6\frac{1}{2}$     D.  $4\frac{1}{2}$     E. none of these
7. A vacuum pump removes  $\frac{2}{5}$  of the air from a container with each stroke. How much of the original air would remain after four strokes?
- A.  $\frac{16}{625}$     B.  $\frac{27}{125}$     C.  $\frac{54}{125}$     D.  $\frac{81}{625}$   
E. none of these
8. George Washington was born 11 years before Thomas Jefferson. In 1770 Washington's age was 3 years more than 7 times the age of Jefferson in 1748. What was the sum of the two men's ages in 1750?
- A. 25    B. 26    C. 24    D. 23    E. 27
9. The total time available to do a certain job is 2 hours. After one machine had been working on this job for one hour, another machine that would have taken two hours less time to do the job alone was brought in. It was put to work with the first machine and the job was finished exactly on time. How many hours would the first machine have taken to do the job alone?
- A. 1    B. 2    C. 3    D. 4    E. none of these

10. A man tosses 1 half dollar, 2 quarters, 3 dimes, and 4 nickels among 10 boys. In how many different ways can the boys profit if each is to get a coin?
- A. 12,600    B. 6,300    C. 30,240    D. 151,200  
E. None of these
11. A painting 18" x 24" is to be placed into a wooden, rectangular frame with the longer dimension vertical. The wood at the top and bottom is twice as wide as the wood on the sides. If the frame area equals that of the painting itself, the ratio of the smaller to the larger dimension of the framed painting is:
- A. 1:3    B. 1:2    C. 2:3    D. 3:4    E. 1:1
12. Two men starting at a point on a circular 1-mile race track walk in opposite directions with uniform speeds and meet in 6 minutes. But if they walk in the same direction, it requires 1 hour for the faster to gain a lap. What is the rate in mph of the slower walker?
- A.  $\frac{3}{40}$     B.  $\frac{11}{120}$     C.  $\frac{9}{2}$     D.  $\frac{11}{2}$     E. none of these
13. The wages of 3 men for 4 weeks is \$108. At the same rate of pay, how many weeks will 5 men work for \$135?
- A. 2.5    B. 3    C. 3.5    D. 4    E. 4.5
14. A contractor estimated that one of his two bricklayers would take 9 hours to build a certain wall and the other would take 10 hours. However, he knew from experience that when they worked together, their combined output fell by 10 bricks per hour. Being in a hurry, he put both men on the job and found that it took exactly 5 hours to build the wall. The number of bricks in the wall was
- A. 500    B. 550    C. 900    D. 950    E. 960

15. A private art collector buys a valuable canvas and is later forced to sell it to an art gallery at a 10% loss. Years later the collector rebuys the same canvas at auction and sells it to a museum for \$37,000 more than the auction price. The collector earned a net profit of 39.5% on the original investment. To the nearest dollar, what was the original price of the picture?

- A. \$74,747    B. \$75,759    C. \$74,600    D. \$75,703  
E. none of these

16. A man walked a certain distance at a constant rate. If he had gone  $\frac{1}{2}$  mile per hour faster, he would have walked the distance in  $\frac{4}{5}$  of the time; if he had gone  $\frac{1}{2}$  mile per hour slower, he would have been  $2\frac{1}{2}$  hours longer on the road. The distance in miles he walked was:

- A.  $13\frac{1}{2}$     B. 15    C.  $17\frac{1}{2}$     D. 20    E. 21

17. A man leaves \$60,000 to his children and grandchildren, seven in all. The children receive  $\frac{1}{3}$  of it, which is \$2,000 more apiece than the grandchildren get. How much does each grandchild receive?

- A. \$6500    B. \$7200    C. \$8000    D. \$8200    E. \$8500

18. Three numbers,  $0 < a < b < c$ , whose sum is 15 are in arithmetic progression. If the sum of their squares is 83, find  $a+2b+3c$ .

- A. 30    B. 32    C. 34    D. 36    E. 38

19. In tennis, the length of a doubles court and a singles court are the same, but the width of a doubles court is 9 feet greater than that of a singles court. The length of a singles court is 6 feet greater than twice the width of a doubles court, and the width of a singles court is 1 foot greater than one-third the length of a doubles court. What are the dimensions of a singles court?
- A. 72' by 25'    B. 75' by 25'    C. 78' by 27'  
D. 81' by 28'    E. none of these
20. A subscription TV cable service estimates that 1000 subscribers will pay \$3.00 each to watch an off-Broadway show in their own homes. They also believe that the number of subscribers will increase by 50 for each 10 cents decrease in the charge. If the firm must receive \$3125 to meet its costs and to earn a profit, how much should they charge each subscriber?
- A. \$1.25    B. \$1.75    C. \$2.00    D. \$2.25  
E. none of these
21. The total cost to produce 10 units of a certain product is \$40, and for 20 units the total cost is \$70. The total cost is linearly related to the number of units produced. Find the total cost of producing 25 units.
- A. \$85    B. \$90    C. \$110    D. \$115    E. none of these
22. Two boys paddled a canoe 6 miles down a river to the point where the river flowed into a lake; then they paddled 4 miles across the lake to a fishing ground. Later they returned over the same route to their starting point. If the trip to the fishing ground required 2 hours, the return trip required 4 hours, and there was no current in the lake, find the rate of the current in the river.
- A.  $\frac{5}{4}$     B. 2    C.  $\frac{5}{2}$     D. 4    E. none of these

23. A water tank holds 6000 cubic feet of water when full. It was drained in fighting a fire at a rate of 60 cubic feet per minute faster than it could be filled. When it was later refilled, it was found that filling it required 50 minutes longer than draining it. What was the drainage rate in cubic feet per minute?

- A. 120    B. 150    C. 240    D. 60    E. none of these

24. A cotton buyer declined an offer of \$17,500 for a consignment of baled cotton. Two months later, when the price of cotton had increased \$5 per bale, he sold the consignment for \$17,640. If, in the meantime, two bales had been destroyed by fire, find the sum of the number of bales in the original consignment and the price per bale of the original offer.

- A. 275    B. 278    C. 300    D. 312    E. none of these

25. It is now between 10:00 and 11:00 o'clock and six minutes from now, the minute hand of a watch will be exactly opposite the place where the hour hand was three minutes ago. What is the exact time now?

- A. 10:14  $\frac{7}{11}$     B. 10:14  $\frac{9}{11}$     C. 10:15    D. 10:15  $\frac{7}{11}$   
 E. 10:17  $\frac{1}{2}$