

AUSTIN PEAY STATE UNIVERSITY
CLARKSVILLE, TENNESSEE 37040

JUNIOR HIGH/MIDDLE SCHOOL
MATHEMATICS COMPETITION

EIGHTH GRADE TEST
1990
SCORING FORMULA: $4R - W + 40$

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Jackson, Tennessee

DIRECTIONS:

This is a test of your competence in Junior High School Mathematics. For each problem there are 5 possible answers listed. You are to work the problems, determine the correct answer, and indicate your choice on the separate answer sheet provided you.

SAMPLE:

1. If $x + 1 = 2$, then x equals
- (a) 0
 - (b) 2
 - (c) -1
 - (d) 1
 - (e) none of the above

1 a. b. c. d. e.
2 a. b. c. d. e.
3 a. b. c. d. e.
4 a. b. c. d. e.
5 a. b. c. d. e.

The correct answer is 1, which is answer (d), so you would answer this problem by darkening the space on the answer sheet corresponding with this choice.

If you should change your mind about an answer, be sure to erase completely. Avoid wild guessing as wrong answers count against you. Do not mark more than one answer for any problem. Make no stray marks of any kind on your answer sheet.

When told to do so, open your test booklet to page 2 and begin. When you have finished one page, go on to the next. The working time for the entire test is 80 minutes.

EIGHTH GRADE
JUNIOR HIGH MATH CONTEST

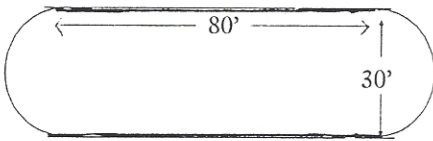
1. Round to the nearest thousandth: 4.27549

- | | | |
|----------|-----------|----------|
| a. 4.280 | b. 4.2755 | c. 4.275 |
| d. 4.276 | e. 4.2750 | |

2. $\$31.40 + \$0.08 + \$779.66 + \$11.54 =$

- | | | |
|---------------|----------------------|---------------|
| a. $\$823.40$ | b. $82,268¢$ | c. $\$830.60$ |
| d. $\$822.70$ | e. none of the above | |

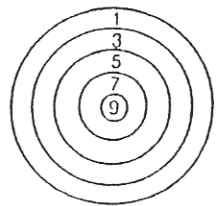
3. Jill wants to construct an exercise arena for her horse, according to the following drawing. How much will it cost to fence this arena if fencing costs $\$5.00$ per foot? (Use $\pi \approx 3.14$)



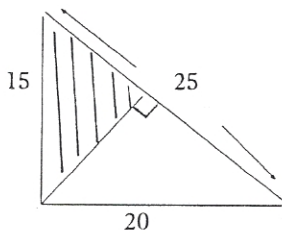
- | | | |
|----------------|----------------|--------------|
| a. $\$127.10$ | b. $\$1271.00$ | c. $\$50.84$ |
| d. $\$1742.00$ | e. $\$4332.50$ | |

4. Henry threw six darts and all six hit the target shown. Which of the following could be his score?

- | | | |
|-------|-------|-------|
| a. 4 | b. 28 | c. 29 |
| d. 56 | e. 31 | |



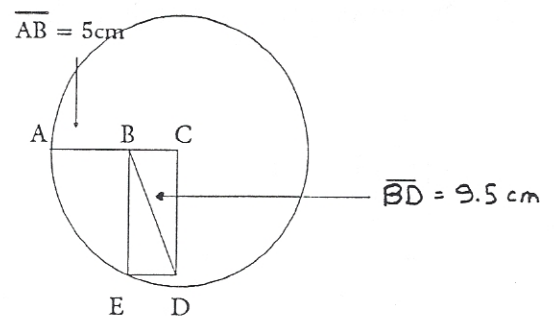
5. Determine the area of the shaded region.



- | | | |
|------------------|-----------------|-----------------|
| a. 150 sq. units | b. 75 sq. units | c. 60 sq. units |
| d. 300 sq. units | e. 54 sq. units | |

6. Use prime factorizations to find the LCM of 32, 63, 144.
- a. 2016 b. 290,304 c. 1008
d. 18,144 e. 239
7. One team's finishing time in a 100km white-water marathon was 700 min. They finished the last kilometer in 5 min. How much faster than their average speed was their speed in the last kilometer?
- a. 0.57143 km/min b. 0.05714 km/min c. 0.6525 km/min
d. 0.6427 km/min e. 5.714 km/min
8. Order the decimals 0.732, 0.731, 0.7031, 0.7321 from the greatest to the least:
- a. 0.7031, 0.731, 0.732, 0.7321
b. 0.732, 0.7321, 0.731, 0.7031
c. 0.731, 0.732, 0.7321, 0.7031
d. 0.7321, 0.732, 0.731, 0.7031
e. 0.7031, 0.731, 0.7321, 0.732
9. $4\frac{2}{3} \times 2\frac{1}{2} \div 3\frac{4}{5}$
- a. $32\frac{4}{15}$ b. $3\frac{19}{52}$ c. $3\frac{4}{57}$
d. $1\frac{101}{114}$ e. $1\frac{3}{4}$
10. An airline agent checked a bag that weighed 33 pounds, another that weighed 4.5 pounds less than the first, another that weighed 12 pounds less than the second, and a fourth that weighed 6.5 pounds more than the second. How many pounds of baggage did the agent check?
- a. 116 b. 113.5 c. 117.5
d. 101 e. 113
11. Given this circle with center C and the rectangle BCDE, find the measure of the length of the diameter of the circle.

- a. 14.5 cm b. 21.3 cm
c. 19 cm d. 22 cm
e. 9.5 cm



12. $-\frac{1}{2}\sqrt{2} + \frac{3}{4}\sqrt{2} - \frac{5}{2}\sqrt{2} =$

a. $\frac{2\sqrt{2}}{8}$

b. $\frac{-2\sqrt{2}}{2}$

c. $\frac{9\sqrt{2}}{4}$

d. $\frac{-5\sqrt{2}}{4}$

e. none of these

13. How many 5 digit numbers that begin with 1 and end in 5 can be formed from the digits 1 through 9, if all 5 of the digits must be different?

a. 336

b. 216

c. 343

d. 210

e. 729

14. Sally is molding pewter cups. For every 5.25 ounce cup, she must pour 6 ounces of molten pewter. If she makes 6 cups, what percent of the pewter will be wasted?

a. .75%

b. .875%

c. 12.5%

d. 14.3%

e. 4.5%

15. Bill owns a mens' shop. When an item arrives, Bill marks it up 60% from the buying price. If it does not sell after 9 weeks, he takes 25% off its price. Four weeks later, if it is still in the store, he takes 30% off that reduced price. If it sells at this price, what percent of the original buying price is a profit or loss?

a. 16% loss

b. 16% profit

c. 20% profit

d. 20% loss

e. 5% profit

16. If $d/4 - (-1/12) < 4/12$, then:

a. $d < 5/3$

b. $d < 1$

c. $d > 1$

d. $d < 1/16$

e. $d < 0$

17. Arthur and Bob were training for a marathon race. They left the gym at 7:55 one morning and ran for $2\frac{1}{2}$ hours, stopped to rest for 24 minutes, and ran back to the gym in $2\frac{1}{4}$ hours. What time did they arrive back at the gym?

a. 12:55 p.m.

b. 1:04 p.m.

c. 1:07 p.m.

d. 12:04 p.m.

e. approx. 12:07 p.m.

18. The square below is divided into 5 congruent rectangles. If the perimeter of one of the rectangles is 30 units, how many units are in the perimeter of the square?

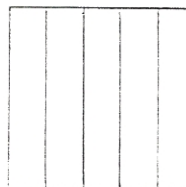
a. 40 units

b. 48 units

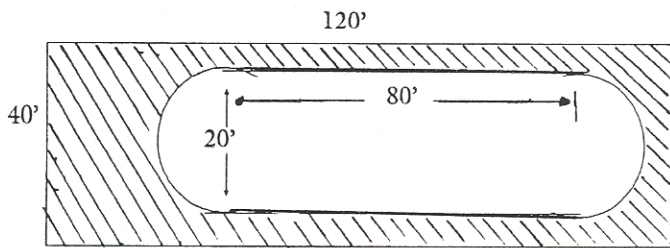
c. 50 units

d. 60 units

e. 54 units



19. The sum of $1\frac{1}{7} + 3\frac{1}{2} + 5\frac{1}{5}$ is between
- a. $9\frac{5}{7}$ and $9\frac{6}{7}$ b. $9\frac{3}{4}$ and $9\frac{5}{6}$ c. 9 and $9\frac{1}{35}$
d. $2\frac{3}{5}$ and $2\frac{3}{4}$ e. $2\frac{3}{7}$ and $2\frac{6}{7}$
20. There are twelve players on the basketball team: 2 centers, 5 guards, and 5 forwards. How many different teams can be formed if the teams consist of 1 center, 2 guards, and 2 forwards?
- a. 40 b. 800 c. 200
d. 50 e. 36
21. Harold is constructing a map of his city using a scale of $\frac{3}{4}$ inches equals 4 miles. If it is 31 miles across the city (east to west), how wide will the paper have to be to draw the map using a 1 inch margin on each side?
- a. $5\frac{3}{16}$ inches b. $7\frac{13}{16}$ inches c. 8 inches
d. $9\frac{3}{4}$ inches e. $13\frac{5}{8}$ inches
22. The city is building a swimming pool and deck. Find the area of the deck.
(Use $\pi \approx 3.14$)



- a. approx. 3137 sq. ft. b. approx. 2800 sq. ft. c. approx. 2886 sq. ft.
d. approx. 3543 sq. ft. e. none of these
23. Eighteen 7th and 8th graders go on a class outing. There are twelve 8th graders and six 7th graders. Three are selected at random for an award by the camp guide. What is the probability that all three will be 7th graders?
- a. $\frac{1}{3} + \frac{5}{17} + \frac{1}{4}$ b. $\frac{1}{27}$ c. $\frac{5}{6}$
d. $\frac{5}{204}$ e. no chance

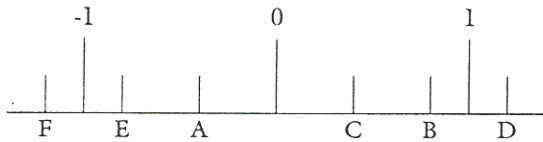
24. Assume the adjoining chart shows the 1980 U. S. population in millions for each region by ethnic groups. To the nearest percent, what percent of the U. S. Black population and U. S. Asian population live in the Southwest region? The total population is 227 million.

	NE	NW	SE	SW
White	42	52	57	35
Black	5	5	15	2
Asian	1	1	1	3
Other	1	1	2	4

- a. 57% b. 2% c. 15%
- d. 18% e. 19%
25. $\frac{2 - \frac{3}{4}}{\frac{2}{3} + 1} =$
- a. $2\frac{1}{4}$ b. $-\frac{9}{4}$ c. $\frac{3}{20}$
- d. $\frac{7}{4}$ e. $\frac{3}{4}$
26. How many whole numbers are between $-\sqrt{8}$ and $\sqrt{80}$?
- a. 9 b. 8 c. 11
- d. 6 e. none
27. If $100 \leq a \leq 200$ and $600 \leq b \leq 1000$, then the smallest value of $(a/b)^2$ is:
- a. $\frac{1}{10}$ b. $\frac{1}{36}$ c. $\frac{1}{100}$
- d. $\frac{1}{9}$ e. $\frac{1}{25}$
28. A box of computer paper containing 360 sheets is 6 cm thick. Approximately how many sheets of this paper would there be in a stack 11.5 cm high?
- a. 660 b. 690 c. 720
- d. 69 e. 4140
29. The fraction that is $\frac{3}{4}$ of the way between $\frac{1}{4}$ and $\frac{2}{3}$ (on the number line) is:
- a. $\frac{11}{16}$ b. $\frac{9}{16}$ c. $\frac{17}{48}$
- d. $\frac{11}{24}$ e. $\frac{7}{16}$

30. The ratio of boys to girls in Ms. Jones' 8th grade class is 4:5. If there are 36 students in the class, how many more boys than girls are in the class?
- a. 16 b. 20 c. 4
d. 0 (same of each) e. none of the above
31. Northview Middle School has 648 students. Each student takes 5 classes a day. Each teacher teaches 4 classes. If there are 30 teachers and each class has just one teacher, how many students are in each class?
- a. 19 or 20 b. 30 c. 21 or 22
d. 27 e. 32
32. Which of the following is base ten equivalent for 1101 base two?
- a. 8 b. 13 c. 26
d. 25 e. 16
33. $(x^3 \times x^2)^2 =$
- a. x^{12} b. x^{100} c. x^{36}
d. x^{10} e. x^7
34. Susan, Kim, and Robin are different weights. Who is the lightest and heaviest if exactly one of the following is true? 1) Susan is heaviest. 2) Kim is not the heaviest. 3) Robin is not the lightest.
- a. Robin is heaviest; Kim is lightest.
b. Kim is heaviest; Susan is lightest.
c. Kim is heaviest; Robin is lightest.
d. Susan is heaviest; Kim is lightest.
e. Robin is heaviest; Susan is lightest.
35. The average pleasure horse is $15\frac{1}{2}$ hands (1 hand = 4 inches). How tall is the average horse to the nearest centimeter (cm)?
- a. 1.57 cm b. 24.4 cm c. 124 cm
d. 157 cm e. 62 cm
36. Which number is the smallest?
- a. 1.21 b. 1 c. $\frac{99}{100}$
d. $\frac{101}{100}$ e. $(\frac{9}{10})^2$

37. If the number A is subtracted from B, what point best represents the results?



- a. E
- b. B
- c. C
- d. D
- e. F

38. A salesman's commission on a \$9,600 used car is \$1,600. What is his rate of commission?

- a. 20%
- b. $12\frac{1}{2}\%$
- c. $16\frac{2}{3}\%$
- d. $14\frac{5}{8}\%$
- e. 22%

39. $4(3^x) = \frac{3^3 + 9^2}{3^2}$ then $x =$

- a. 1
- b. 3
- c. 7
- d. $\frac{1}{4}$
- e. 0

40. Mr. McClinnock has a square bed for tomatoes and a square bed for potatoes in his garden. The perimeter of the tomato bed is 49 meters. The area of the potato bed is 144 meters. How much longer or shorter are the sides of the potato bed than the tomato bed?

- a. $\frac{1}{4}$ m longer
- b. 5 m longer
- c. $23\frac{3}{4}$ m longer
- d. $\frac{1}{4}$ m shorter
- e. 5 m shorter

