

Junior High School Mathematics Competition

SEVENTH GRADE TEST

1983

SCORING FORMULA: $4R - W + 40$

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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.

1. $0.35 =$

a. $\frac{3}{50}$

b. $\frac{7}{20}$

c. $\frac{3}{10}$

d. $\frac{2}{7}$

e. $\frac{3}{5}$

2. $8 + 64 \div 2^2 \cdot 2$

a. 36

b. 16

c. 8

d. 40

e. 9

3. The number 67,000,000 expressed in scientific notation is

a. 67×10^6

b. 6.7×10^6

c. 6.7×10^7

d. 0.67×10^8

e. none of the above

4. $2\frac{11}{12} \div 5\frac{5}{8} =$

a. $16\frac{13}{32}$

b. $\frac{44}{75}$

c. $11\frac{7}{15}$

d. $\frac{22}{27}$

e. $\frac{14}{27}$

5. One meter is the same length as

a. $\frac{1}{100}$ cm

b. 100 cm

c. 1000 cm

d. $\frac{1}{100}$ km

e. 100 mm

6. A number is called "perfect" if it equals the sum of its proper divisors. For instance, 6 is a perfect number since its proper divisors are 1, 2, and 3, and $1 + 2 + 3 = 6$. Which of the following numbers is perfect?
- a. 8
b. 12
c. 20
d. 28
e. 40
7. $6\% \cdot 6\% =$
- a. .36%
b. 3.6%
c. 36%
d. 360%
e. none of the above
8. How many volumes of a set of encyclopedias can be placed on a shelf 3 feet long if each volume is 1.5 inches thick?
- a. 20
b. 24
c. 45
d. 54
e. 2
9. The least common multiple of $3^2 \cdot 5 \cdot 7^3 \cdot 11$ and $2^3 \cdot 3 \cdot 7^2 \cdot 13^2$ is
- a. $3 \cdot 7^2$
b. $2^3 \cdot 3^3 \cdot 5 \cdot 7^3 \cdot 11 \cdot 13^2$
c. $2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13$
d. $2^3 + 3^2 + 5 + 7^3 + 11 + 13^2$
e. $2^3 \cdot 3^2 \cdot 5 \cdot 7^3 \cdot 11 \cdot 13^2$
10. $3.6 \div .0012 =$
- a. 3
b. 30
c. 3000
d. 300
e. 30,000
11. $\overline{.5} =$
- a. $\frac{1}{2}$
b. $\frac{5}{9}$
c. $\frac{9}{5}$
d. $\frac{5}{11}$
e. $\frac{11}{20}$

12. Which of the following numbers is between $\overline{.75}$ and $\overline{.76}$?
- a. .751
 b. $\overline{.751}$
 c. $\overline{.761}$
 d. $\overline{.7}$
 e. .7
13. B is a set with the properties that $\{1, 3, 4\} \subset B$, $\{3, 5, 7\} \subset B$, $\{2, 4, 6, 8\} \cap B = \{4, 6\}$ and B has 6 elements. B =
- a. $\{1, 2, 3, 4, 5, 6\}$
 b. $\{2, 3, 4, 5, 6, 7\}$
 c. $\{2, 3, 4, 5, 6, 8\}$
 d. $\{1, 2, 3, 4, 5, 7\}$
 e. $\{1, 3, 4, 5, 6, 7\}$
14. $(1.1)(.12) =$
- a. 13.2
 b. 1.32
 c. .132
 d. .0132
 e. .00132
15. What is the mean for the set of scores 85, 95, 72, 84, 94, 68?
- a. 83
 b. $84\frac{1}{2}$
 c. 68
 d. 96
 e. 85
16. $(7 \cdot 6)4 = 4(7 \cdot 6)$ is an instance of which property?
- a. Associative property of multiplication
 b. Commutative property of multiplication
 c. Distributive property
 d. Closure property
 e. Identity property

17. Which of the following numbers is between $\frac{2}{3}$ and $\frac{3}{4}$?

a. $\frac{5}{6}$

d. $\frac{17}{24}$

b. $\frac{7}{12}$

e. $\frac{19}{24}$

c. $\frac{31}{48}$

18. Which of the following is a true sentence?

a. $\frac{4}{0} = 0$ and $\frac{0}{4} = 0$.

b. $\frac{4}{0} = 4$ and $\frac{0}{4} = 4$.

c. $\frac{4}{0} = 0$ and $\frac{0}{4}$ is not defined.

d. $\frac{4}{0}$ is not defined and $\frac{0}{4} = 0$.

e. $\frac{4}{0}$ is not defined and $\frac{0}{4}$ is not defined.

19. What is the area of the right triangle in the diagram?

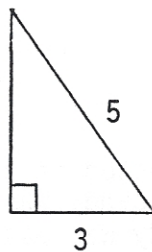
a. $7\frac{1}{2}$ square units

b. 12 square units

c. 6 square units

d. 15 square units

e. 8 square units



20. January 1, 1983, was a Saturday. What day of the week will January 1, 1984, be?

a. Sunday

d. Wednesday

b. Monday

e. Thursday

c. Tuesday

31. $\frac{1}{x} + \frac{1}{y} =$

a. $\frac{2}{x + y}$

d. $\frac{x + y}{xy}$

b. $\frac{1}{x + y}$

e. $\frac{xy}{x + y}$

c. $\frac{1}{xy}$

32. A hat contains slips of paper numbered 1 through 9 and one slip is drawn at random. What is the probability that the number drawn is not divisible by 3?

a. $\frac{4}{9}$

d. $\frac{2}{3}$

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

e. $\frac{7}{9}$

c. 0

33. If the pattern at the right is continued, what is the number on the tenth row that immediately precedes the equals sign?

$$1 + 2 = 3$$

$$4 + 5 + 6 = 7 + 8$$

$$9 + 10 + 11 + 12 = 13 + 14 + 15$$

a. 110

d. 111

b. 90

e. 109

c. 132

34. $\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \dots + \frac{1}{23 \cdot 24} =$

a. $\frac{11}{12}$

d. $\frac{23}{24}$

b. $\frac{15}{16}$

e. $\frac{25}{23}$

c. $\frac{22}{23}$

35. An advertisement for a tire company states that they are having a 20-20 sale. They explain that this means that the tires were discounted 20% and then were discounted 20% again. What single discount would be equivalent?

a. 40%

d. 38%

b. 36%

e. 20%

c. 42%

36. Find the smallest of three consecutive even integers whose sum is 108.

a. 38

d. 32

b. 36

e. 18

c. 34

37. A fair coin is tossed 3 times and turns up heads each time. What is the probability of a head on the 4th toss?

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

d. $\frac{1}{8}$

b. $\frac{1}{16}$

e. 2

c. 1

38. What is the unit's digit for 6^{83} ?

a. 1

d. 6

b. 2

e. 8

c. 4

39. How many squares are pictured altogether?

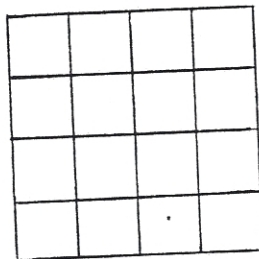
a. 16

b. 20

c. 25

d. 28

e. 30



40. The average of three numbers is 80. If two of them are 74 and 78, then what is the other number?

a. 76

d. 86

b. 84

e. none of the above

c. 88

