

TEXAS ALLIANCE FOR MINORITIES IN ENGINEERING STATE MATH & SCIENCE COMPETITION

MIDDLE SCHOOL MATHEMATICS

General Information:

- Check to see that you have written your name on the label and that the test name on the label matches the name on this booklet.
- **DO NOT** open the test booklet and **DO NOT** start until the proctor says "begin."
- Each individual exam period will be 45 minutes and each exam contains 40 multiple choice questions.
- Students are allowed to use a non-programmable battery operated calculator during the individual and team exams.
- Students are encouraged to write on the exam booklet. Scratch paper and pencils will also be provided.
- Students will not be permitted to leave the test room while the test is in progress. If a student finishes early, he/she must remain in the test room until the exam period is completed.
- If you need to ask a question during the test, raise your hand and the proctor will come to you.
- There is no penalty for skipping a problem. The exam scores will be determined by the number of correct answers. All ties will be broken by awarding the place to the contestant who has the most consecutive correct answers before a problem is missed.
- **Students may NOT keep the test booklet.**

MIDDLE SCHOOL MATHEMATICS

1. Super Video rents 3 video tapes for \$5.00. In one week Super Video had rented 675 videotapes. How much money did Super Video record in rental receipts that week?
a. \$225 b. \$675 c. \$725 d. \$1,125 e. \$1,500
2. The West Texas School District has 8 elementary schools and 2 high schools. The enrollment at the elementary schools is 3693 students, while the enrollment at the high schools is 1,307. What is the average student enrollment per school in the West Texas School District?
a. 263 b. 490 c. 500 d. 675 e. 800
3. Bleacher seat tickets to the Socorro Cubs baseball game cost \$4.50 each. How many tickets were sold by the Socorro Boosters if they collected \$900?
a. 100 b. 150 c. 200 d. 250 e. 300
4. A video recorder costs \$259, and Elsa pays \$25 down on the purchase price. If Elsa makes 6 equal monthly payments after the downpayment, what must she pay each month?
a. \$49 b. \$45 c. \$43 d. \$41 e. \$39

For questions 5 and 6, refer to the following passage.

The Muleshoe Vending Company purchased 15 cases of potato chips at \$7.00 per case, to use in its snack machines. Each case of potato chips had 36 three-ounce bags which sold for 50 cents per bag.

5. If all the bags of potato chips were purchased, how much money was collected from the vending machines?
a. \$7.50 b. \$120.00 c. \$150.15 d. \$195.00 e. \$270.00
6. What was the profit to the nearest dollar made on the sale of the 15 cases of potato chips?
a. \$120.00 b. \$165.00 c. \$195 d. \$250 e. \$270.00
7. The Wet and Wooly Pet Shop ordered 475 goldfish for its grand opening giveaway. If each customer received 3 fish, how many fish were left after 105 customers visited the store?
a. 60 b. 80 c. 150 d. 160 e. 300
8. An architect's drawing was drawn so the scale of $\frac{1}{2}$ inch represented 6 feet. What was the actual height of a wall drawn $4\frac{1}{2}$ inches high?
a. 9ft. b. 18ft. c. 27ft. d. 36ft. e. 54ft.

9. If it takes $4\frac{3}{4}$ ounces of tint to mix one gallon of paint to the desired color, how many ounces of tint will be needed for 5 gallons?
- a. 19 b. 20 c. $23\frac{2}{3}$ d. $23\frac{3}{4}$ e. 95
10. Leon Parris is a dress designer for a national clothing chain. To fill an order of 150 dresses of one style and one size, he must order the required amount of fabric. If one dress requires $3\frac{1}{2}$ yards of fabric, how many yards of fabric will be needed to make the dresses?
- a. 525 b. 475 c. 450 d. 425 e. 400
11. Susie and Terry Alonzo needed 84 square feet of ceramic tile to remodel their home. If the average weight for each square foot of tile was $6\frac{1}{4}$ pounds, how many pounds of tile did they need for the job?
- a. 525 b. 250 c. 87.5 d. 84 e. 25
12. Abelardo wrote 4 checks for the following amounts: \$43.21, 221.20, 32.50, and 150.59. If the bank charges a service charge of \$.15 per check, how much money was left in Abelardo's account if his opening balance was \$547.73?
- a. \$20.56 b. \$39.52 c. \$67.83 d. \$89.42 e. \$99.63
13. Mr. Chang sold 150 shares of stock at \$37.75. If he originally paid \$25.85 for each share, what was his profit on the sale of the stock?
- a. \$129.25 b. \$188.75 c. \$1,785.00 d. \$3,877.50 e. \$5,662.50
14. What is the total cost of 6 battery-operated screwdrivers for \$19.98 each? Include the cost of 28 batteries that sell 2/\$1.79.
- a. \$25.06 b. 25.50 c. \$50.12 d. \$119.88 e. \$144.94
15. Juana has \$1.50 in change in a mason jar. There are 15 nickels, 5 dimes, and 25 pennies. What is the probability of selecting a dime on the first pull?
- a. $\frac{1}{9}$ b. $\frac{1}{3}$ c. $\frac{1}{2}$ d. $\frac{5}{9}$ e. $\frac{2}{3}$
16. Candy is packaged in a box that has 4 rows with 6 pieces per row. One row has nuts, another has cream filling, another has jelly, and the last has cherries. What is the probability of selecting a cream filled piece of candy?
- a. $\frac{4}{5}$ b. $\frac{3}{5}$ c. $\frac{1}{2}$ d. $\frac{2}{5}$ e. $\frac{1}{4}$
17. A flower vase of carnations contains 3 white, 4 lavender, 2 yellow, and 6 red carnations. If one flower is randomly picked, what is the probability that it will be white?
- a. $\frac{2}{15}$ b. $\frac{1}{5}$ c. $\frac{1}{3}$ d. $\frac{2}{5}$ e. $\frac{3}{5}$

18. During the last week Leo spent the following time studying for the postal examination:

Monday	2 hour, 15 minutes
Tuesday	3 hour
Wednesday	45 minutes
Thursday	1 hour, 40 minutes
Friday	2 hours, 20 minutes

What is the average amount of time spent studying per day?

- a. 2 hours
- b. 2 ½ hours
- c. 3 hours
- d. 3 /12
- e. 4 hours

19. As a receptionist, Yolanda earns \$195 per week and pays 3% of her salary for health insurance. What does she pay annually for health insurance?

- a. \$195.00
- b. \$234.00
- c. \$304.20
- d. \$468.00
- e. \$585.00

20. As an apprentice carpenter, Grace earns \$7.75 per hour. When her apprenticeship is over, her salary will increase to \$11.75 per hour. By what percent of her current pay will her salary increase after she becomes a carpenter?

- a. 40%
- b. 47%
- c. 50%
- d. 52%
- e. 63%

21. Mr. Wilberforce drove his cab 26,503 miles last year for the Dimebox Cab Company. His total automotive expense was \$8,475. What was the average cost per mile, to the nearest cent, to operate his taxi?

- a. \$.25
- b. \$.27
- c. \$.29
- d. \$32
- e. \$.35

Use the chart below for the following three questions:

**Average Weekly Earnings of Production Workers
by Major Industry**

	Mining	Construction	Manufacturing	Transportation & Public Utilities	Wholesale Trade
1965	\$123.52	\$138.52	\$107.53	\$125.14	\$106.49
1975	249.31	266.08	190.79	233.44	183.05
1985	519.93	464.46	386.37	450.30	351.74

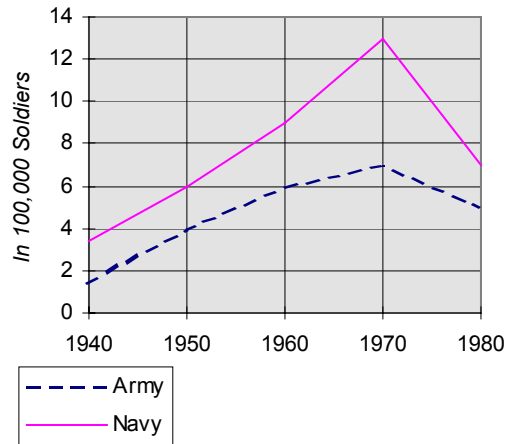
22. Which industry had the greatest increase in weekly earnings between 1965 and 1985?

- a. Mining
- b. construction
- c. manufacturing
- d. transportation & public utilities
- e. wholesale trade

23. Which major industry paid the least in average weekly salary in 1985?
 a. Mining b. construction c. manufacturing d. transportation and public utilities e. wholesale trade
24. To the nearest percent, the 1965 mining salary is what percent of the 1985 mining salary?
 a. 24% b. 27% c. 28% d. 30% e. 31%

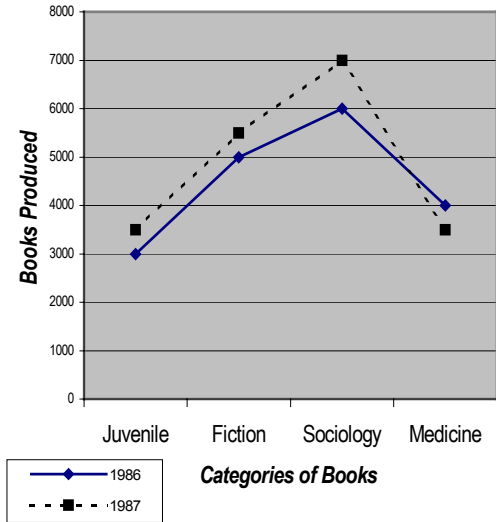
For questions 25 - 28, refer to the diagram below.

Navy and Army Military Strength



25. What was the approximate total of military strength for the Army and Navy in 1940?
 a. 50 b. 5,000 c. 50,000 d. 500,000 e. 5,000,000
26. The Navy represented what fractional part of the military strength in 1960 between these two branches of the military?
 a. $\frac{1}{2}$ b. $\frac{3}{5}$ c. $\frac{2}{3}$ d. $\frac{5}{7}$ e. $\frac{7}{13}$
27. What was the combined strength for 1980 for these two branches of the military?
 a. 1,200 b. 12,000 c. 102,000 d. 1,000,000 e. 1,200,000
28. Which expression determines the average military strength during 1950?
 a. $(4,000 + 6,000) / 2$
 b. $(40,000 + 60,000) / 2$
 c. $(400,000 + 600,000)$
 d. $(400,000 + 600,000) / 2$
 e. $(400,000 + 600,000) 2$

Book Production



Use the chart at left to answer the following four questions.

29. What was the number of juvenile books produced in 1986?

- a. 3,000
- b. 3,500
- c. 4,500
- d. 5,000
- e. 5,500

30. How many more sociology books were produced in 1986 than 1987?

- a. 500
- b. 1,000
- c. 1,500
- d. 3,500
- e. 4,000

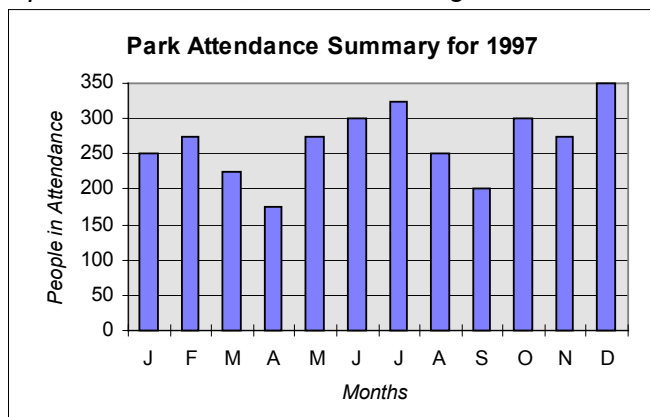
31. The average number of books produced in these four categories for 1987 is shown by which expression below?

- a. $(7,500 + 3,500 + 3,500 + 5,000) / 4$
- b. $(6,000 + 4,000 + 3,000 + 5,500) / 4$
- c. $(3,500 + 5,000 + 7,000 + 3,500) / 4$
- d. $(3,000 + 5,500 + 3,500 + 5,000) / 4$
- e. $(7,500 + 3,500 + 3,500 + 5,000)$

32. The increase in the number of fiction books produced between 1986 and 1987 is what percentage?

- a. 10%
- b. 20%
- c. 30%
- d. 40%
- e. 50%

For questions 33 - 40, refer to the diagram below.



33. Which of the following statements is untrue?

- a. January and August were equal months in attendance.
- b. February, May, and November were equal months in attendance.
- c. July and October were equal months in attendance.
- d. December was the greatest attendance month.
- e. September was the lowest attendance month.

34. What was the average attendance for January, February, and March?
- a. 225 b. 250 c. 300 d. 350 e. 400
35. What was the average number of people who visited the park during the months of January, June, August, and September.
- a. 125 b. 150 c. 175 d. 200 e. 250
36. What was the median number of people who visited the park during 1997?
- a. 175 b. 200 c. 262.5 d. 275 e. 300
37. To determine the total amount of money taken in for entry at the gate, what piece of information is needed.
- a. The cost of maintenance of the park
b. The cost of the tickets for admission
c. The cost of the workers
d. The cost of parking
e. The cost of management
38. In a semi-annual report, Tim O'Neal reported the lowest attendance to the highest attendance by months. Which of the following expresses the order in which attendance was reported for the first half of the year?
- a. January, February, March, April, May, and June.
b. February, March, April, May, June, and January.
c. March, April, May, June, January, and February.
d. April, May, June, January, February and March.
e. April, March, January, February and May and June.
39. Which of the following expressions gives the average attendance for September, October, November, and December?
- a. $(200 + 300 + 275 + 350) / 4$
b. $(200 + 300 + 275 + 350)$
c. $(250 + 275 + 225 + 175) / 4$
d. $(250 + 275 + 225 + 175)$
e. $(400 + 325 + 250 + 200)$
40. If tickets cost \$5 per person, what was the amount of money taken in by the park during June of 1988?
- \$875 b. \$1,125 c. \$1,250 d. \$1,500 e. \$2,000

Answer Key

1. d
2. c
3. c
4. e
5. e
6. b
7. d
8. e
9. d
10. a
11. a
12. e
13. c
14. e
15. a
16. e
17. b
18. a
19. c
20. d
21. d
22. a
23. e
24. a
25. d
26. b
27. e
28. d
29. b
30. b
31. b
32. a
33. c
34. b
35. e
36. d
37. b
38. e
39. b
40. d