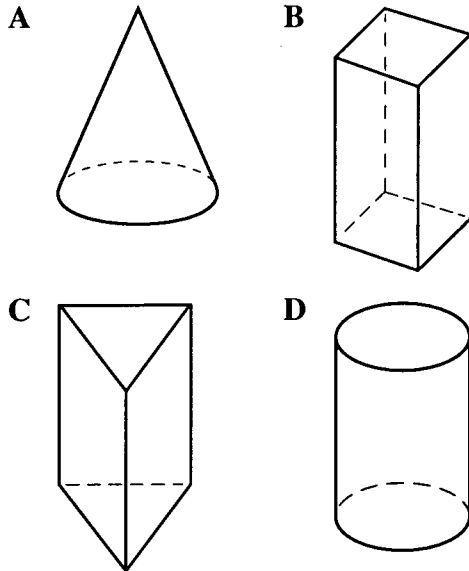
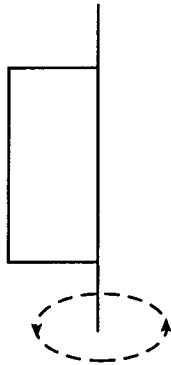




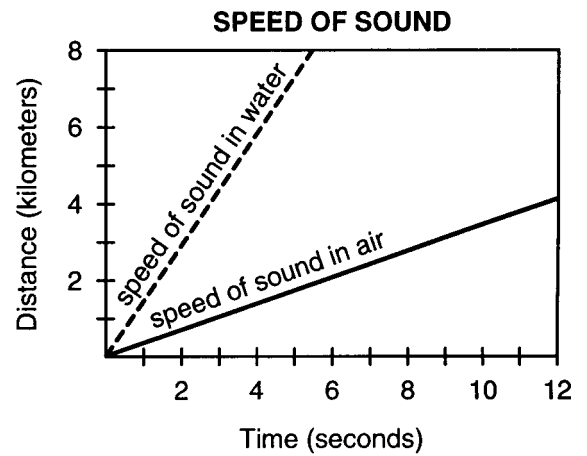
**High School Test
in
Mathematics**

*Released Items
Spring 2000*

- 1 If you attach a rectangle to a wire as shown in the diagram below, and rotate it by spinning the wire between your fingers, you would generate which of the following 3-dimensional figures?



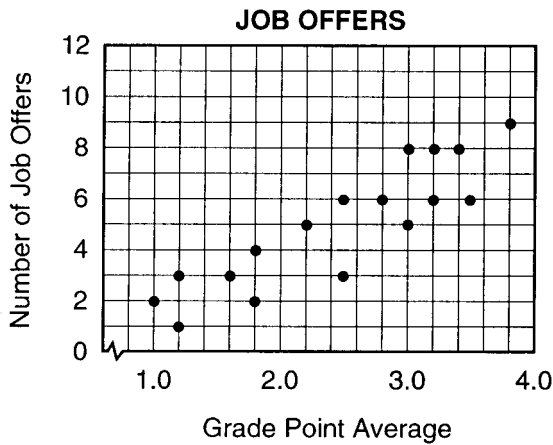
3



The graph shows the speed of sound in air compared with the speed of sound in water. Based on the graph, which statement is **TRUE**?

- A Sound travels faster in air than in water.
 - B Sound travels faster in water than in air.
 - C The distance sound travels in water is determined by the time it travels in air.
 - D The speed of sound is determined by multiplying the distance it travels by the time.
- 4 After the homecoming dance, the student clean-up committee collected all the empty drink containers. There were 25 more 10¢ deposit containers than 5¢ deposit containers. Which expression represents the monetary value of the empty drink containers?
- A $0.15n$
 - B $0.15(n + 25)$
 - C $0.10n + 0.05(n + 25)$
 - D $0.05n + 0.10(n + 25)$

- 5 The scatter plot below shows the number of job offers and grade point averages for the students in an economics class. Which of the following would describe the best-fit line for the given data points?



- A a horizontal line
- B a vertical line
- C a line with a negative slope
- D a line with a positive slope

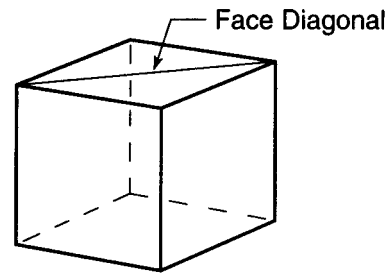
- 6 A pizza parlor decided to give away one of six different posters of the Detroit Red Wings hockey players with each pizza sold. To simulate how many pizzas a person would have to buy to collect all six posters, the students in a math class decided to assign one number to each of the six posters and roll a number cube, numbered 1 through 6. The results of the first 20 rolls are listed below in the order in which they were rolled.

4, 1, 1, 4, 6, 3, 3, 2, 2, 4,
5, 1, 6, 2, 5, 1, 5, 3, 2, 1

Based on this simulation, what is the minimum number of pizzas a person would have to buy to collect all six posters? (Assume there is an equally likely chance of getting any poster.)

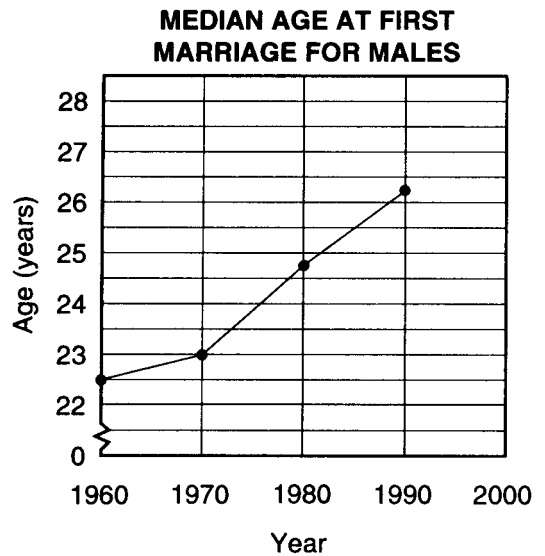
- A 6
- B 8
- C 11
- D 20

- 12 A vertical cut is made through the cube along the diagonal of the top face as shown below. Which two identical solids will be produced?



- A rectangular pyramids
- B rectangular prisms
- C triangular pyramids
- D triangular prisms

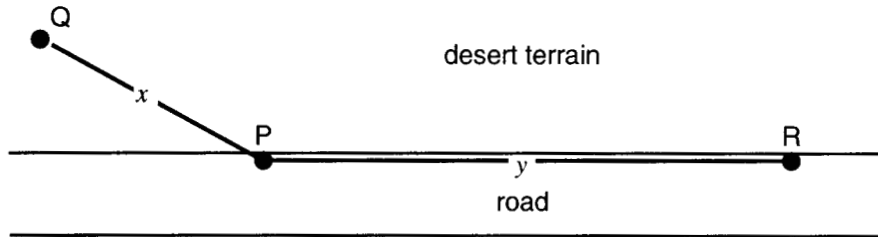
- 13 If the trend shown on this graph continues, at what median age would a man marry for the first time in the year 2000?



- A younger than 26.0
- B between 26.0 and 26.9
- C between 27.0 and 28.0
- D older than 28.0

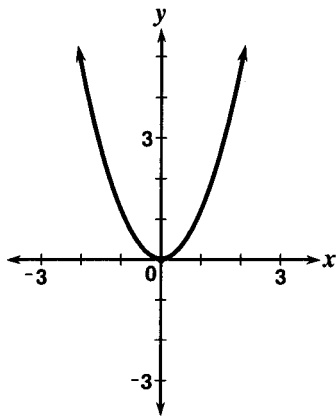
- 17 Given: A vehicle can travel across the desert at 20 mph. Its road speed is 50 mph.
 The distance from Q to P is x miles.
 The distance from P to R is y miles.

Which expression represents the time it would take to travel from Q to R through P ?



- A $20x + 50y$ B $50x + 20y$ C $\frac{x}{20} + \frac{y}{50}$ D $\frac{(x+y)}{(20+50)}$

- 19 Look at the graph below. Which table **BEST** represents the graph?



- | | | | | | | | | | | | |
|----------|---|---|---|----|----|----|---|---|---|---|----|
| A | <table border="1"><tr><td>x</td><td>y</td></tr><tr><td>-2</td><td>4</td></tr><tr><td>-1</td><td>1</td></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td></tr></table> | x | y | -2 | 4 | -1 | 1 | 0 | 0 | 1 | 1 |
| x | y | | | | | | | | | | |
| -2 | 4 | | | | | | | | | | |
| -1 | 1 | | | | | | | | | | |
| 0 | 0 | | | | | | | | | | |
| 1 | 1 | | | | | | | | | | |
| B | <table border="1"><tr><td>x</td><td>y</td></tr><tr><td>-2</td><td>4</td></tr><tr><td>-1</td><td>1</td></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>-1</td></tr></table> | x | y | -2 | 4 | -1 | 1 | 0 | 0 | 1 | -1 |
| x | y | | | | | | | | | | |
| -2 | 4 | | | | | | | | | | |
| -1 | 1 | | | | | | | | | | |
| 0 | 0 | | | | | | | | | | |
| 1 | -1 | | | | | | | | | | |
| C | <table border="1"><tr><td>x</td><td>y</td></tr><tr><td>-2</td><td>-4</td></tr><tr><td>-1</td><td>1</td></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td></tr></table> | x | y | -2 | -4 | -1 | 1 | 0 | 0 | 1 | 1 |
| x | y | | | | | | | | | | |
| -2 | -4 | | | | | | | | | | |
| -1 | 1 | | | | | | | | | | |
| 0 | 0 | | | | | | | | | | |
| 1 | 1 | | | | | | | | | | |
| D | <table border="1"><tr><td>x</td><td>y</td></tr><tr><td>-2</td><td>-4</td></tr><tr><td>-1</td><td>1</td></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>-1</td></tr></table> | x | y | -2 | -4 | -1 | 1 | 0 | 0 | 1 | -1 |
| x | y | | | | | | | | | | |
| -2 | -4 | | | | | | | | | | |
| -1 | 1 | | | | | | | | | | |
| 0 | 0 | | | | | | | | | | |
| 1 | -1 | | | | | | | | | | |

- 21 Two automobiles with different fuel efficiencies both travel 12,000 miles per year. Car A averages 40 miles per gallon and Car B averages 24 miles per gallon. How many fewer gallons of gasoline would Car A require per year?

- A 200 B 300
 C 500 D 750

- 22 The students in an economics class made the following table to show the number of television sets in their homes.

Number of Television Sets	Number of Students Responding
3 or more	6
2	13
1	9
0	2

If the students in the economics class are representative of the students in the entire school, how many of the school's 600 students would you predict have 3 or more television sets in their homes?

- A 60 B 120
 C 180 D 200

- 23 The total number of bacteria in a petri dish is 2,598,960. What is this number written in scientific notation?
- A 2.59896×10^{-6}
B 2.59896×10^6
C 259896×10^{-1}
D 259896×10^1
- 25 A rectangle has $(0,12)$, $(3,16)$, and $(12,3)$ as coordinates of three of its vertices. Which coordinates represent the fourth vertex of the rectangle?
- A $(15,-1)$ B $(15,7)$
C $(16,6)$ D $(8,0)$
- 26 A rectangle that is **NOT** a square has side lengths that are whole numbers. If the perimeter of the rectangle measures 8 cm, what is the area of the rectangle?
- A 3 cm^2 B 4 cm^2
C 12 cm^2 D 15 cm^2
- 29 The school paper charges \$1.50 for an ad, plus 25 cents per word. Carl wants to spend only \$12.00 on the ad. What is the maximum number of words that can be in his ad?
- A 18 B 42
C 48 D 54
- 32 Three points lie on the same line. If the coordinates of two of the points are $(0,-6)$ and $(4,0)$, which of the following coordinates could represent the third point?
- A $(2,-3)$ B $(2,-2)$
C $(3,-2)$ D $(1,-5)$

(2 Points)

- 35 Vivian is graduating from high school next year and is considering attending college to study engineering. She read an article that listed the average starting salary as \$40,000 among 100 engineering students who graduated last year. The article noted that the average included one graduate who was also a basketball star, who had signed a \$1.5 million per year professional contract. Explain why the average starting salary might be misleading. Include calculations or equations to support your explanation.

35a) Sample Response

The average starting salary might be misleading because the addition of 1.5 million to the total salary amount will increase the average.

This is because...

1. ➤ the actual starting salary is \$25,252 for the 99 students, compared to \$40,000 for all 100.

$$100 \text{ graduates} \times \$40,000/\text{graduate} = \$4,000,000$$

$$\$4,000,000 - \$1,500,000 = \$2,500,000$$

$$\$2,500,000 \div 99 \text{ graduates} \approx \$25,252/\text{graduate}$$

OR
2. ➤ the actual starting salary is \$25,252 for the 99 students, compared to \$40,000 for all 100.

$$(x + 1,500,000) \div 100 = 40,000$$

$$x + 1,500,000 = 4,000,000$$

$$x = 2,500,000 \quad 2,500,000 \div 99 \approx \$25,252$$

OR
3. ➤ there is a \$15,000 difference between the actual salary and \$40,000.

$$\$40,000 - \$25,000 = \$15,000$$

OR
4. ➤ an outlier will cause the average to be skewed (use of hypothetical numbers).

$$1 + 2 + 3 + 4 = 10 \quad 10 \div 4 = 2.5$$

$$1 + 2 + 3 + 4 + 500 = 510 \quad 510 \div 5 = 102$$

OR
5. ➤ if starting salary actually is \$40,000, then $99 \times \$40,000 = \$3,960,000$

$$3,960,000 + 1,500,000 = 5,460,000 \quad 5,460,000 \div 100 = 54,600$$
 which is much higher than 40,000.

OR
6. ➤ the basketball player's salary is 37.5% of the total salary while each of the other 99 students only account for 0.6% of the total salary.

$$1,500,000 \div 4,000,000 = .375 \times 100 = 37.5\%$$

$$25,000 \div 4,000,000 = .006 \times 100 = 0.6\%$$

(4 Points)

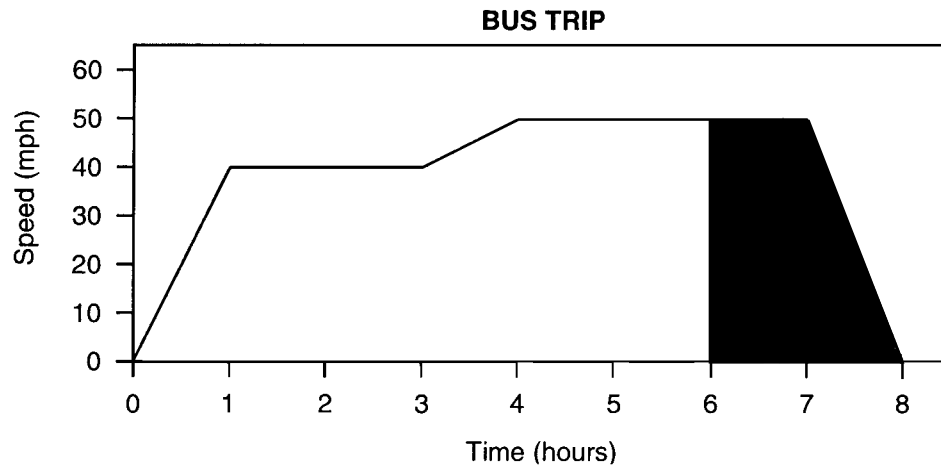
- 36 Through July 31, a baseball team won 42 games and lost 56. They have 52 games remaining on their schedule. In order to win the league title, a team must usually end the season with a record of **AT LEAST** 0.600. (The record expressed as a decimal equals the number of wins divided by the number of games played.)
- A If the team is to finish with a record of 0.600, explain how you would determine the number of remaining games they must win. How many more games must the team win to have a record of 0.600?

**ANSWER THIS ITEM IN YOUR ANSWER BOOKLET.
NOTHING WRITTEN IN THE SPACE BELOW WILL BE SCORED.**

- B What is the **HIGHEST** record for the complete year the team can achieve with the remaining number of games? What is the **LOWEST** record? Express your answers as decimals by dividing the number of wins by the number of games played.

(3 Points)

- 37 The graph shows the average speed of a bus which carried a touring band during an 8-hour trip. The distance the bus traveled can be found by computing the area under the graph. For example, the distance traveled in the last two hours can be found from the area computed for the shaded portion on the graph.



Using the method described above, find the distance traveled in the first four hours. Provide the work that shows how you arrived at your answer.