

**Mathematics Attitudes, Skills, & Knowledge Survey
(MASKS)
Level 2 Form C**

Directions to Students:

Do not open this booklet until you are told to do so. Please respond to the following items by marking the best answer on your answer sheet using a #2 pencil. Please do not write on this survey. Scratch paper will be provided on request. If you do not understand what is being asked in an item, please ask the survey administrator for clarification.

Calculators are not permitted on this exam.

Please Do Not Write On This Test Booklet



Arizona Collaborative for Excellence in the Preparation of Teachers
Supported by the National Science Foundation under Grant DUE-0084434
January 2001

1. Which best describes your race or ethnic background?
 - A. American Indian
 - B. Asian/Pacific Islander
 - C. Hispanic
 - D. Black
 - E. Other

2. What is the highest level of education your mother obtained?
 - A. did not finish high school
 - B. high school graduate
 - C. some education after high school
 - D. college graduate
 - E. I don't know

3. What is the highest level of education your father obtained?
 - A. did not finish high school
 - B. high school graduate
 - C. some education after high school
 - D. college graduate
 - E. I don't know

Use the following key to indicate whether you agree/disagree with items 4 – 10.

A. strongly agree B. agree C. not sure D. disagree E. strongly disagree

4. Math is one of my favorite subjects.

5. Math is mostly rules, procedures, and formulas.

6. The ability to identify a pattern increases with the amount of data collected.

7. I try hard to make sense out of math problems.

8. A variable is a quantity that never changes.

9. If I don't get the correct answer quickly to a math problem, I give up.

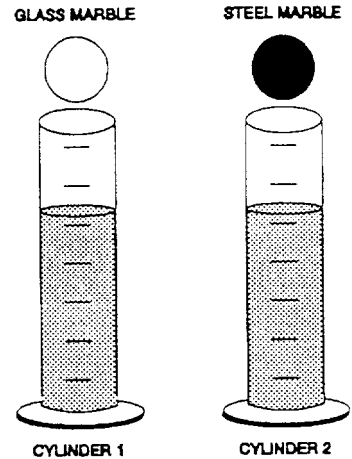
10. Identifying relationships between quantities is an important part of math.

11. To the right are drawings of two cylinders filled to the same level with water. The cylinders are identical in size and shape.

Also shown at the right are two marbles, one glass and one steel. The marbles are the same size but the steel one is much heavier than the glass one.

When the glass marble is put into Cylinder 1 it sinks to the bottom and the water level rises to the 6th mark. If we put the steel marble into Cylinder 2, the water will rise

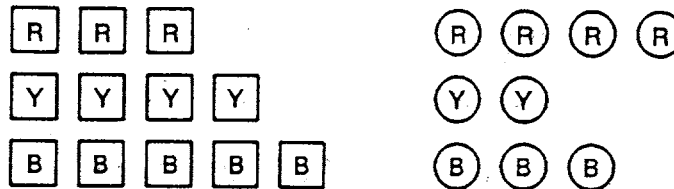
- A. to the same level as it did in Cylinder 1
- B. to a higher level than it did in Cylinder 1
- C. to a lower level than it did in Cylinder 1



12. because

- A. the steel marble will sink faster.
- B. the marbles are made of different materials.
- C. the steel marble is heavier than the glass marble.
- D. the glass marble creates less pressure.
- E. the marbles are the same size.

13. Three red square pieces of wood, four yellow square pieces, and five blue square pieces are put into a cloth bag. Four red round pieces, two yellow round pieces, and three blue round pieces are also put into the bag. All the pieces are then mixed about. Suppose someone reaches into the bag (without looking and without feeling for a particular shape piece) and pulls out one piece.

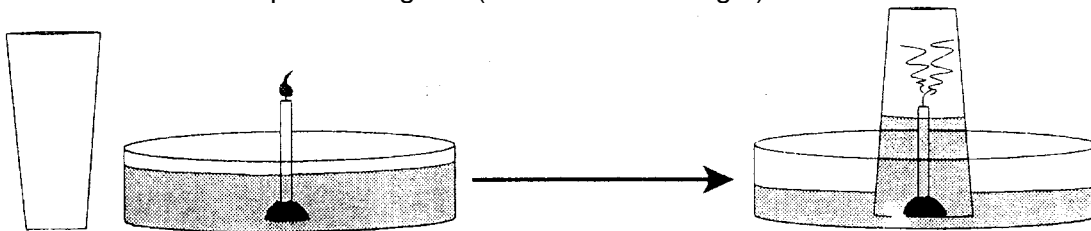


What are the chances that the piece is a red round or blue round piece?

- A. can not be determined
- B. 1 chance out of 3
- C. 1 chance out of 21
- D. 15 chances out of 21
- E. 1 chance out of 2

14. because
- A. 1 of the 2 shapes is round.
 - B. 15 of the 21 pieces are red or blue.
 - C. there is no way to tell which piece will be picked.
 - D. only 1 of the 21 pieces is picked out of the bag.
 - E. 1 of every 3 pieces is a red or blue round piece.

15. The figure below at the left shows a drinking glass and a burning birthday candle stuck in a small piece of clay standing in a pan of water. When the glass is turned upside down, put over the candle, and placed in the water, the candle quickly goes out and water rushes up into the glass (as shown at the right).



This observation raises an interesting question: Why does the water rush up into the glass?

Here is a possible explanation. The flame converts oxygen into carbon dioxide. Because oxygen does not dissolve rapidly into water but carbon dioxide does, the newly-formed carbon dioxide dissolves rapidly into the water, lowering the air pressure inside the glass.

Suppose you have the materials mentioned above plus some matches and some dry ice (dry ice is frozen carbon dioxide). Using some or all of the materials, how could you test this possible explanation?

- A. Saturate the water with carbon dioxide and redo the experiment noting the amount of water rise.
 - B. The water rises because oxygen is consumed, so redo the experiment in exactly the same way to show water rise due to oxygen loss.
 - C. Conduct a controlled experiment varying only the number of candles to see if that makes a difference.
 - D. Suction is responsible for the water rise, so put a balloon over the top of an open-ended cylinder and place the cylinder over the burning candle.
 - E. Redo the experiment, but make sure it is controlled by holding all independent variables constant; then measure the amount of water rise.
16. What result of your test (mentioned in #15 above) would show that your explanation is probably wrong?
- A. The water rises the same as it did before.
 - B. The water rises less than it did before.
 - C. The balloon expands out.
 - D. The balloon is sucked in.

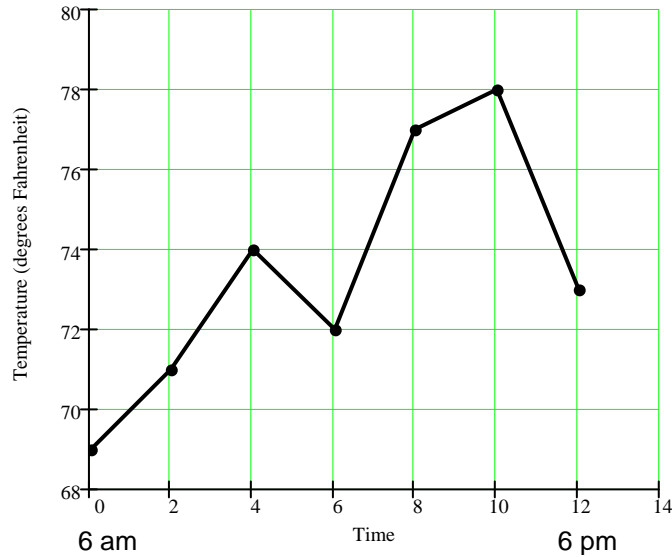
Use the table and given information to answer questions 17 and 18. (like NAEP #2, C section 4, accession number AP000779)

Time Card Name: J. Jasmine	Number of Hours	Average Hourly Wage	Total Daily Earnings
Mon. 10:00 a.m. – 3:00 p.m.	5	5.50	27.50
Tues. 9:00 a.m. – 4:00 p.m.	7	5.50	38.50
Wed. 3:00 p.m. – 7:00 p.m.	4	5.75	23.00
Thurs. 2:00 p.m. – 8:00 p.m.	6		
Fri. 5:00 p.m. – 10:00 p.m.	5	6.00	30.00

17. According to the information above, what is the average hourly wage for Thursday's earnings if the total earnings for the five days were \$153.50?
- A. \$ 5.75
 - B. \$ 6.25
 - C. \$ 19.83
 - D. \$ 25.58
18. The hourly wage rate changes at some hour during the day. At what time does the hourly wage rate change?
- A. 3:00 p.m.
 - B. 4:00 p.m.
 - C. 5:00 p.m.
 - D. 8:00 p.m.
19. Bill purchased a new car that was selling for a price of \$19,200. He paid \$4,800 as a down payment and obtained a 36-month car loan to finance the remainder of the selling price. If his monthly payments were \$451, what was the total amount, including the down payment, that Bill paid for the car? (NAEP #2, C section 4, accession number A0002335)
- A. \$11,436
 - B. \$16,236
 - C. \$19,200
 - D. \$21,036
 - E. \$24,000
20. Donna decides to buy a new car that is selling for \$16,500. If she is required to pay 20 percent of the selling price as a down payment, what is the number of dollars required for the down payment? (NAEP C Section 4, accession number AP002334)
- A. \$330
 - B. \$1,650
 - C. \$3,300
 - D. \$4,125
 - E. \$13,200

21. Of the following, which is the best unit to use when measuring the growth of a plant every other day during a 2-week period? (NAEP C Section 4, accession number HW000842)
- A. Centimeter
 - B. Meter
 - C. Kilometer
 - D. Foot
 - E. Yard
22. A cereal company packs its oatmeal into cylindrical containers. The height of each container is 10 inches and the radius of the bottom is 3 inches. What is the volume of the box to the nearest cubic inch? (The formula for the volume of a cylinder is $V = \pi r^2 h$.) (like NAEP #6, C section 4, accession number HW000853)
- A. 30π
 - B. 60π
 - C. 90π
 - D. 300π
23. If each of the counting numbers from 1 through 10 is multiplied by 13, how many of the resulting numbers will be even? (NAEP #4, C section 4, accession number HW000851)
- A. One
 - B. Four
 - C. Five
 - D. Six
 - E. Ten

For problems 24 and 25 refer to the following graph. Note that time = 0 corresponds to 6:00 a.m.



24. According to the graph above, the temperature at 10:00 a.m. is approximately how many degrees greater than the temperature at 8 a.m.? (NAEP #1, P section 3, accession number M000669)
- A. 1
 - B. 1.5
 - C. 2
 - D. 3
25. According to the graph above, what is the approximate average rate of change in temperature from 10 a.m. to 4 p.m.?
- A. 1 degree per hour
 - B. $\frac{3}{2}$ degree per hour
 - C. $-\frac{2}{3}$ degree per hour
 - D. $\frac{2}{3}$ degree per hour