2010 AATM Sixth Grade Math Contest
Practice Problems

The two individual events will be **algebra** and **geometry**. The two team events are on **measurement** and **problem-solving**. The following are the performance objectives from the Arizona mathematics standard for grade 6 that are addressed within the contest.

- Recognize and describe a relationship between two quantities, given by a chart, table, or graph, using words and expressions.
- Use an algebraic expression to represent a quantity in a given context.
- Create and solve two-step equations that can be solved using inverse properties with fractions and decimals.
- Translate both ways between a verbal description and an algebraic expression or equation
- Evaluate an expression involving the four basic operations by substituting given fractions and decimals for the variable.
- Solve problems using properties of supplementary, complementary, and vertical angles.

- Identify a simple translation or reflection and model its effect on a 2-dimensional figure on a coordinate plane using all four quadrants.
- Draw a reflection of a polygon in the coordinate plane using a horizontal or vertical line of reflection.
- Graph ordered pairs in any quadrant of the coordinate plane
- State the missing coordinate of a given figure on the coordinate plane using geometric properties to justify the solution.

- Determine the appropriate unit of measure for a given context and the appropriate tool to measure to the needed precision (including length, capacity, angles, time, and mass).

- Solve problems involving conversion within the U.S. Customary and within the metric system.
- Estimate the measure of objects using a scale drawing or map.
- Solve problems involving the area of simple polygons using formulas for rectangles and triangles.
- Solve problems involving area and perimeter of regular and irregular polygons.
- Describe the relationship between the volume of a figure and the area of its base.

Sample Problems:

1. If a radius of circle 8 cm long, how long is a diameter?

A) 4 cm
B) 8 cm
C) 16 cm
D) 64 cm

2. Mary has 41¢ in coins. No two coins have the same value. How many coins does Mary have?

A) 4
B) 5
C) 6
D) 7

3. A man needs six pieces of wire, each 218 centimeters long. Wire is sold only by the meter. How many meters of wire must the man buy?

A) 13
B) 14
C) 18
D) 1308

4. Two circles and one straight line are drawn. Find the largest possible number of intersection points for this drawing.

A) 2
B) 4
C) 6
D) 8

5. Find the number of seconds in 3.5 hours.

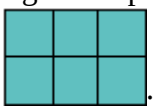
A) 210
B) 3600
C) 10800
D) 12600

6. In a class of 30 students, exactly 7 have tape recorders, exactly 15 have pocket calculators, and exactly 2 have both. How many of the 30 students have neither?

A) 10
B) 8
C) 6
D) 4

7. A rectangular lot 30 m by 40 m is surrounded on all 4 sides by a concrete walk 5 m wide. Find the area of the surface of the walk.

A) 800 m^2
B) 700 m^2
C) 375 m^2
D) 350 m^2

8. In the diagram  , three rectangles are pictured -- two small ones and one larger one. How many rectangles are pictured in  .

A) 7
B) 9
C) 16
D) 18

9. A rectangle has a length of 8 cm and a width of 5 cm. Find the perimeter of the rectangle.

A) 13 cm
B) 26 cm
C) 40 cm
D) 80 cm

10. The perimeter of an equilateral triangle is 24 cm. The length of one side of this triangle is
A) 8 cm
B) 12 cm
C) 16 cm
D) 72 cm

11. The scale of a map is: $\frac{3}{4}$ of an inch = 10 miles. If the distance on the map between two towns is 12 inches, the actual distance between the towns is

A) 90 miles
B) 120 miles
C) 150 miles
D) 160 miles

12. There is a balance scale. On one side is put a full brick. On the other side is put both a half-brick and a 6 lb. weight. Both sides now weigh the same. Find the weight of the full brick.

A) 3 lbs.
B) 6 lbs.
C) 9 lbs.
D) 12 lbs.

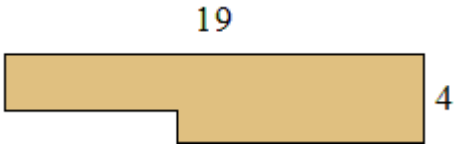
13. The next number in the sequence 1, 1, 2, 3, 5, 8, 13, . . . is

A) 21
B) 20
C) 19
D) 15

14. The Hulk is 3 cm taller than Tarzan and 4 cm shorter than Superman. If Superman's height is 2 meters, then Tarzan's height is

A) 193 cm
B) 197 cm
C) 203 cm
D) 207 cm

15. All angles in the figure are right angles. The perimeter of the figure is between



A) 15 and 26
B) 37 and 44
C) 45 and 55
D) 100 and 200

16. Solve for n in the equation: $\frac{1}{7}n - 3 = 2$

A) 5
B) 7
C) 14
D) 35

17. Which of the following is the largest amount?

A) 20 ounces
B) 3 cups
C) 2 pints
D) $\frac{1}{2}$ gallon

18. Examine the table, and then write an algebraic equation that shows how x and y are related.

x	3	4	5	6	7
y	11	14	17	20	23

A) $x + y = 14$
B) $3x + 2y = 20$
C) $3x + 2 = y$
D) $x + 8 = 11$

19. Which of the measurements would be used to describe the distance between two towns?

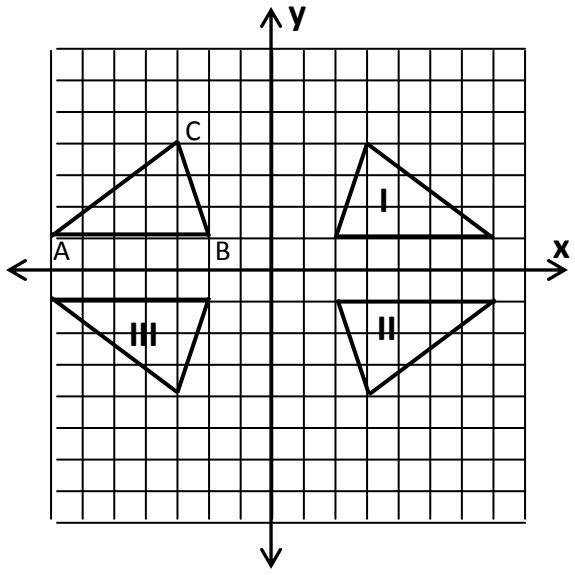
A) feet
B) meters
C) millimeters
D) kilometers

20. If today is a Saturday and is the 11^{th} of the month, what day of the week would the 28^{th} of this month be?

A) Monday
B) Tuesday
C) Thursday
D) Sunday

21. ΔABC is reflected over the x-axis. Which triangle is this reflection?

A) I
B) II
C) III

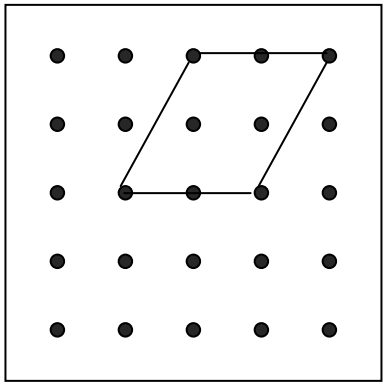


22. Evaluate the expression $3xy - y$ given $x = \frac{2}{3}$ and $y = 2$.

A) 1
B) 2
C) $1/3$
D) $4/3$

23. Find the area of the figure shown on the geoboard. Pegs are one unit apart.

A) 4 square units
B) 3 square units
C) $2\ 1/2$ square units
D) $3\ 1/2$ square units



24. Two angles are supplementary. If one angle has a measure of 25 degrees, then the measure of the other angle is:

A) 25 degrees
B) 180 degrees
C) 155 degrees
D) 65 degrees

25. A product of a number and 3 is decreased by 10. An expression that describes this is:

A) $n/3 - 10$
B) $3n - 10$
C) $10n - 3$
D) $3n + 10$

Answers to the Practice Test:

1. C	2. A	3. B	4. C	5. D
6. A	7. A	8. D	9. B	10. A
11. D	12. D	13. A	14. A	15. C
16. D	17. D	18. C	19. D	20. B
21. C	22. B	23. A	24. C	25. B