

Kansas City Area Teachers of Mathematics
2017 KCATM Contest

Mathletics

Grade 5

Instructions:

- Do **NOT** turn this page until instructed to do so.
- WRITE YOUR **TEAM NUMBER** AND **SCHOOL NAME** ON THE LINE PROVIDED ON THE FRONT OF EACH SHEET EACH TIME YOU BEGIN A NEW PROBLEM.
- You will want to use a calculator on this test, but **NO cell phones** calculators can be used!
- Blank scratch paper can be used. Please do **NOT** write on the team number card, as they are reused each year.
- You may **not** use rulers, protractors or other measurement devices on this test.

Problems # 1-3

This is a relay problem.

Team Number: _____ School: _____

Students: _____

Problems 1-3 (3 minutes, 3 points)

1. Determine the **largest 3 digit number divisible by 15**.

Answer: _____

Determine the **least common multiple (LCM)** of 6, 18, 27.

Answer: _____

2. The **product** of your answers in #1 _____ and #2 _____ is the yearly salary at a job. If all employees work 40 hours per week, 52 weeks a year, what would the **hourly wage** be for this employee?

Answer: _____ \$ per hour

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Problem # 4

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Problem 4 (2 points, 2 minutes)



A marathon is a race that is 26 miles.

To the nearest meter, how many **meters** is a marathon race?

One kilometer is 0.62 miles.

Answer: _____ meters

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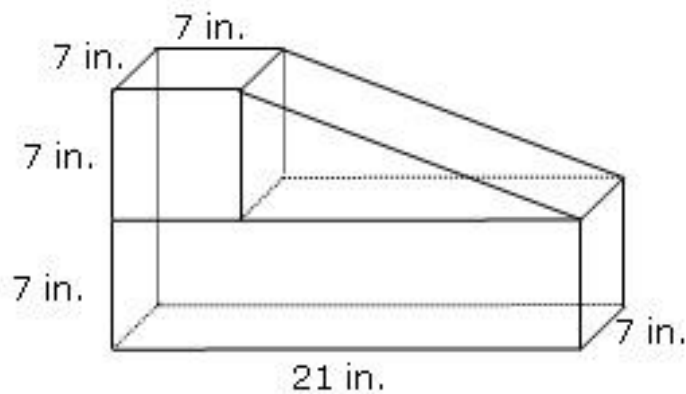
Problem # 5

Do NOT turn the page until you are told to do so.

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Problem 5 (3 minutes, 3 points)

Find the **volume** of the composite shape below made up of two rectangular prisms and one triangular prism.



Volume: _____ in³

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Problem # 6

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Problem 6 (3 minutes, 3 points)

There are 3 different ways a company ships shirts to their customers.

- Bag – holds 1 shirt
- Box – holds 48 bags
- Crate – holds 18 boxes

**One shirt weighs 12 ounces.
What is the total weight, in pounds,
in a full crate?**



Answer: _____ pounds

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Problem # 7

Do NOT turn the page until you are told to do so.

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Problem 7 (1 minute, 1 point)

At 75 miles per hour, how many miles do you travel in 1 hour, 45 minutes?

Do NOT round your answer. Leave your answer in exact decimal form.



Answer: _____ miles

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Problem # 8

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Problem # 9

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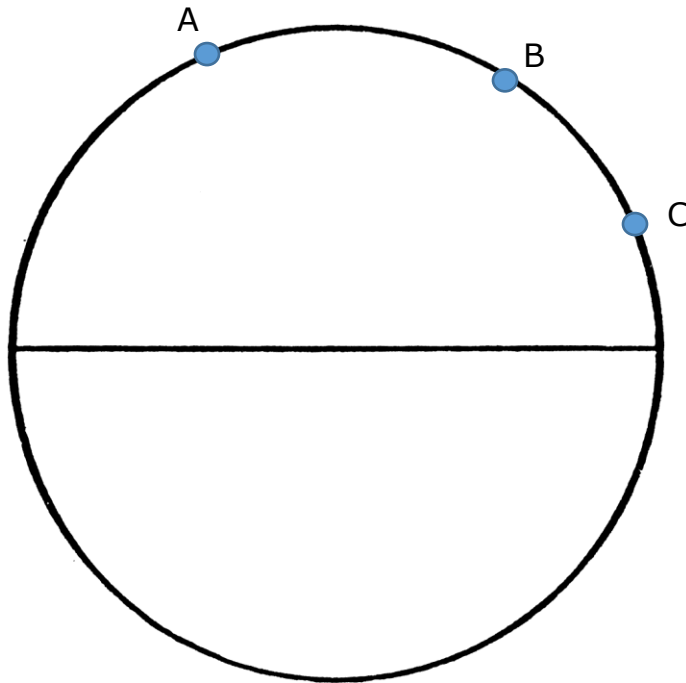
Team Number: _____ School: _____

Problem 9 (2 points, 2 minutes)

Use the circle below to **join segments from a point on the circle to the ends of the diameter**. Three different sample points, A, B, and C have been placed on the circle for you to use, each one would be a vertex of three sample triangles.

Additional information: All triangles created this way are known as triangles inscribed in a semi-circle. The angle in the triangle with the vertex on the circle (called an inscribed angle) has a measure equal to half the intercepted arc, a half circle.

What type of triangles are formed?



Answer: _____ triangles

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Problem # 10

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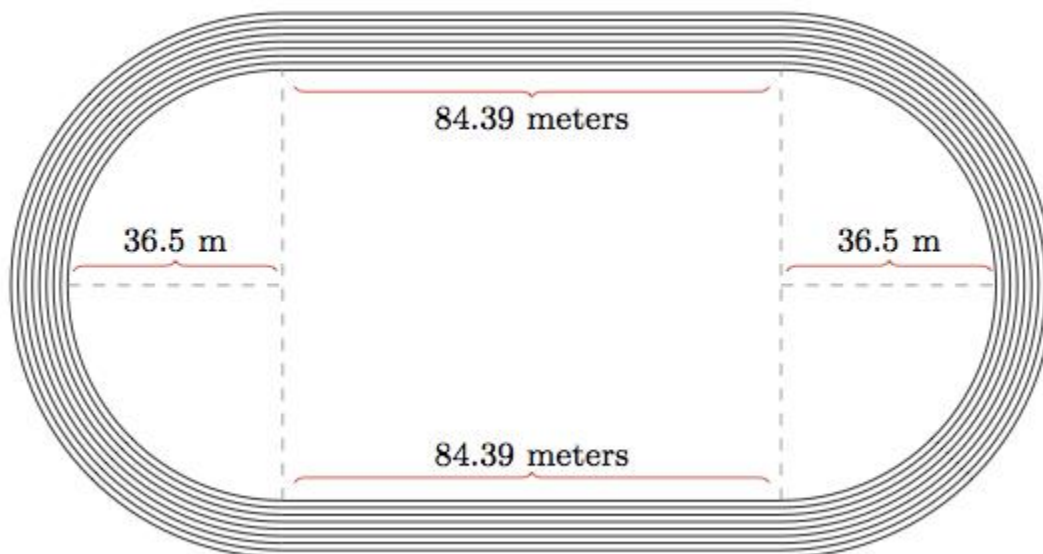
Problem 10 (2 points, 2 minutes)

Find the distance to the nearest meter around the inside lane on the following track.

$$C = \pi d = 2\pi r$$

$$A = \pi r^2$$

Use 3.14 for π .



Answer: _____ meters

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Problem # 11

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Problem 11 (2 points, 2 minutes)

Athletes, coaches, timekeepers, and judges need to stay hydrated during track meets. You have volunteered your expertise on determining the **fewest number of cases of bottled water needed** to supply everyone the water they need to make through a 3 day track meet with 117 athletes, 8 coaches, 20 time keepers and judges. Each day each person will require:

- **4 bottles per athlete**
- **3 bottles per coach**
- **2 bottles per time keeper and judge**



Each case holds 24 bottles.

Answer: _____

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Problem # 12

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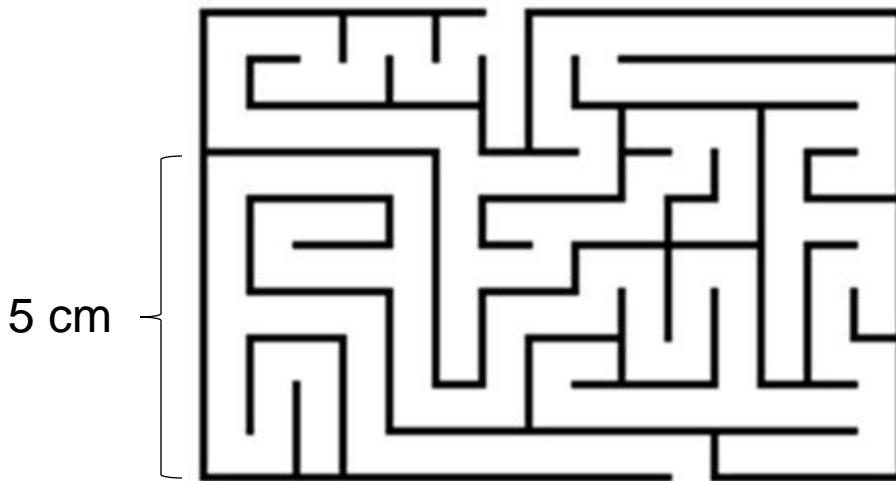
Team Number: _____ **School:** _____

Problem 12 (3 points, 3 minutes)

Determine the area of the following maze using the given information.

Two-thirds of the width is 5 centimeters.

The length is three less than twice the width.



Answer: _____ sq. cm

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Problem # 13

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Problem 13 (3 points, 3 minutes)

Two hundred sixty-four total cartons of eggs are packaged per month at an egg farm. The farmer gives you the following information:

- $\frac{1}{6}$ of the total cartons are small, which hold 8 eggs each
- $\frac{2}{3}$ of the total cartons are medium, each holding a dozen eggs
- The rest of the cartons are large, holding 18 eggs each.



Determine how many eggs are packaged each month at this farm.

Answer: _____ eggs

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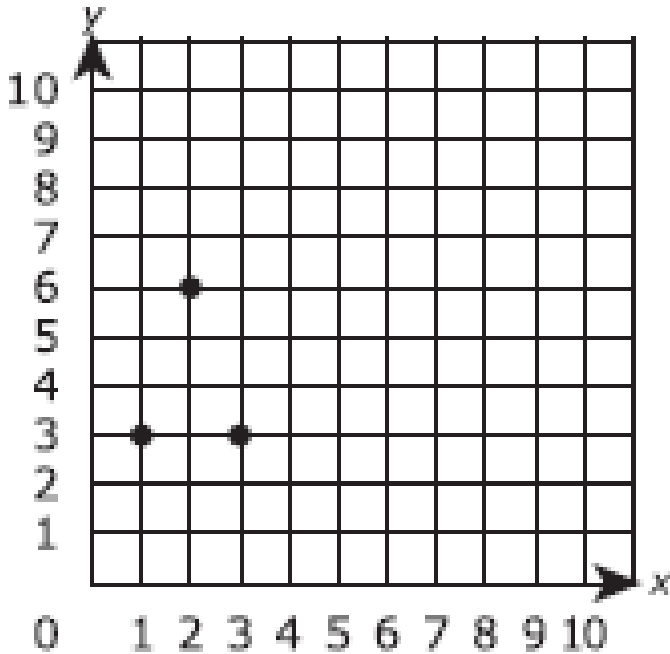
Problem # 14

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Problem 14 (2 points, 2 minutes)

The following coordinate plane has the vertices of an isosceles triangle. Write the coordinates of the vertex angle of the triangle and determine the area of the triangle with each grid is 1 sq. unit.



Answers

Vertex = (_____, _____)

Area = _____ sq. units

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Problem # 15

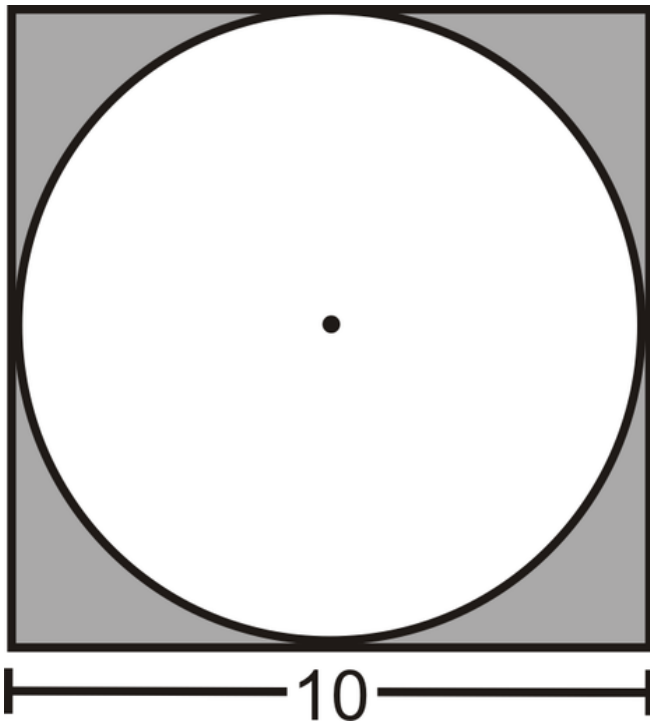
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Problem 15 (2 points, 2 minutes)

The side of the square is 10 inches. **What is the area of the shaded part between the circle and the square?**

Use 3.14 for π



Answer: _____ square inches

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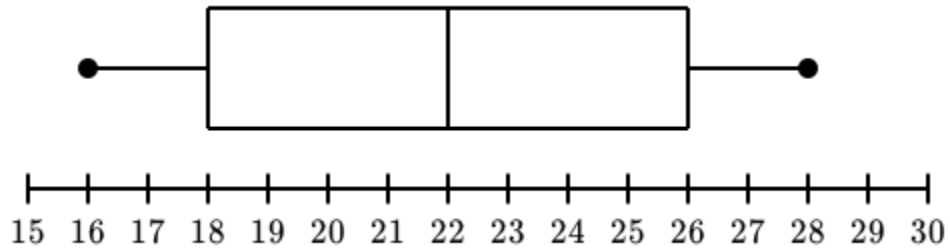
Problem # 16

Do NOT turn the page until you are told to do so.

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Problem 16 (3 points, 3 minutes)

Ages of College Students



The box plot (box and whisker plot) above shows the data from one college tracking the ages of their students. Each of the four sections in the box plot represents 25% of the college students.

If 4,500 students go to this college, determine the **median**, the **range**, and the **number of students between the ages of 18 and 26**.

Median Age: _____

Range of Ages: _____

of students between 18 and 26: _____ **students**

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Problem # 17

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Problem 17 (2 points, 2 minutes)

A ball is dropped and **rebounds $\frac{3}{4}$ of the dropped height** each time it bounces. It is dropped from 128 feet and keeps on bouncing. **How far will it have traveled when it strikes the ground for the 3rd time?**



Answer: _____ ft.

TEAM #: _____ School Name _____