Kansas City Area Teachers of Mathematics
2018 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: _____

_____

_____

Thank you to www.aplusclick.org for the wonderful resource of problems for this Mathletics exam 2018.

Problems 1-3 *(3 minutes, 3 points)*

1. What Fahrenheit temperature is freezing?

Answer: _____

2. Use the answer to #1 as the amount of money you are going to the store with to go shopping. You find the following items. Find the ones you can purchase to get you the closest to the dollar amount you have (answer to 1) without going over. What is the total amount of your purchase?

T-shirt	$9.99
Ball cap	$15.99
Socks	$4.99
Shoes	$23.99

Answer:

Total Cost: _____

3. The tax on your items is 9.5%. What is the total cost for the items which includes tax? Do you have enough money?

Answer:

Cost + Tax: _____

Do you have enough money? _____

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Problem # 4

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Team Number: _____ School: _____

Problem 4 *(2 points, 2 minutes)*

In a family photo, I see 1 grandmother, 1 grandfather, 2 fathers, 2 mothers, 2 daughters, and 2 grandchildren.

What is the **smallest number of people** possible that are in the family photo?

ANSWER: _____

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Problem # 5

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Team Number: _____ School: _____

Problem 5 *(3 points, 3 minutes)*

A driver fills her gas tank and records the reading on the odometer. It is 11,432.6.

A week later, she fills the tank again. It takes 10.6 gallons of gas to fill the tank. The odometer now reads 11,739.4.

1. To the **nearest tenth of a mile**, how many **<u>miles per gallon</u>** (mpg) did the car get?

ANSWER: _____mpg

Using your calculated mpg, **<u>how many gallons</u>** (to the **nearest gallon**) would it take to make a trip from Kansas City to Orlando, Florida? The distance is **1,238 miles**.

ANSWER: _____gallons

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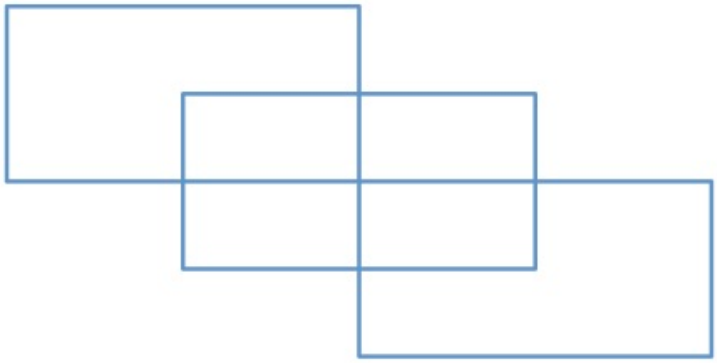
Problem # 6

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

Team Number: _____ School: _____

Problem 6 *(1 minute, 1 point)*

What is the number of rectangles of all sizes in the diagram?



ANSWER: _____

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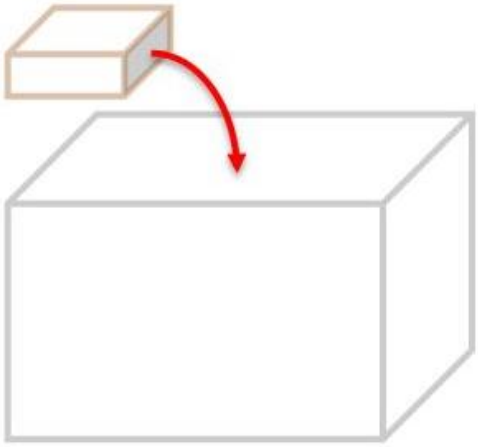
Problem # 7

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

Team Number: _____ School: _____

Problem 7 *(2 minutes, 2 points)*

How many boxes measuring 1 x 2 x 3 can be packed into a container measuring 4 x 5 x 6?



ANSWER: _____

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Problem # 8

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

Team Number: _____ School: _____

Problem 8 *(3 points, 3 minutes)*

You are a CSI investigator, so you are taking data on the distance a car travels by your home over a period of a few seconds as part of your investigation. You want to **calculate how fast the car is going in miles per hour.**

The technique is called **dimensional analysis** where the fractional labels reduce the same as when you simplify fractions in multiplication.

If a car travels 300 feet in 7 seconds, complete the dimensional analysis fraction multiplications in the chart below to find the rate in miles per hour. Round the rate to the **nearest tenth**.

$$\frac{\text{300 ft}}{\text{7 sec}} \times \frac{\text{1 mile}}{\text{5280 ft}} \times \frac{\text{60 sec}}{\text{1 min}} \times \frac{\text{60 min}}{\text{1 hr}} = \_\_\_\_\_ \ \frac{\text{miles}}{\text{hour}}$$

ANSWER: _____ mph

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Problem # 9

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

Team Number: _____ School: _____

Problem 9 *(3 points, 3 minutes)*

At a bank, Niara exchanged a $10 bill for **equal numbers** of nickels, dimes, and quarters. How many of each type of coin did Niara receive for her $10 bill?

ANSWER: _____

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Problem # 10

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

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Problem 10 *(2 points, 2 minutes)*

Time is money! If one minute is worth $24,000 for Bill Gates, **how many <u>dimes</u> is one hour worth for Bill Gates, the owner of Microsoft**?

ANSWER: _____ dimes

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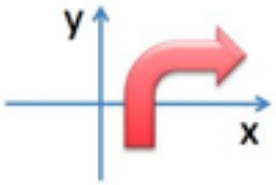
Problem # 11

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

Team Number: _____ School: _____

Problem 11 *(1 point, 1 minute)*

The shape is to be reflected 3 times over the vertical line y and then reflected 1 time over the horizontal line x. Find its new position.



A 

B 

C 

D 

ANSWER: _____

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Problem # 12

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

Team Number: _____ School: _____

Problem 12 *(1 point, 1 minute)*

Put the following numbers in ascending (**smallest to largest**) order:

0.2, 1/9, 75% , 0.9, 7/10, 5%

ANSWER: _____,_____,_____,_____,_____,_____

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Problem # 13

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

Team Number: _____ School: _____

Problem 13 *(2 points, 2 minutes)*

Which of the following numbers cannot be written as the sum of 2 ,3 or 4 consecutive whole numbers?

Consecutive numbers are numbers that follow each other such as 12, 13 or 20, 21, 22

7 **8** **9** **10**

ANSWER: _____

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Problem # 14

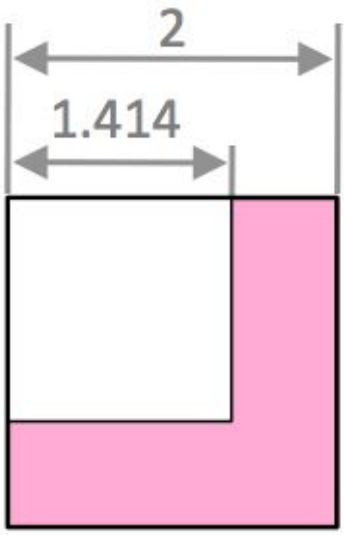
Do NOT turn the page until you are told to do so.

Team Number: _____ School: _____

Problem 14 *(3 points, 3 minutes)*

There are **2 squares** in the figure below.

1. To the **nearest tenth of a percent**, **what percent is the perimeter of the smaller square compared to the perimeter of the shaded figure.**



Perimeter %: _____

2. To the **nearest percent, what percent is the area of the smaller square to the area of the larger square?**

Area %: _____

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Problem # 15

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Team Number: _____ School: _____

Problem 15 **(3 points, 3 minutes)**

Add any 3 of the following numbers. How many different sums can you get?

1 2 3 4 5 6

ANSWER: _____

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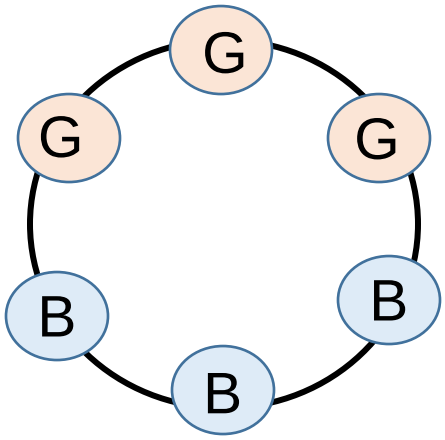
Problem # 16

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

Team Number: _____ School: _____

Problem 16 *(1 point, 1 minute)*

How many **different pairs** of one boy and one girl can be formed from 3 boys and 3 girls?



ANSWER: _____

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Problem # 17

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Team Number: _____ School: _____

Problem 17 *(2 points, 2 minutes)*

What number is half of a quarter of one-eighth of 128?

ANSWER: _____

TEAM #: _____School Name_____