AMTNJ Middle School Mathematics Contest – 2017

Non-Calculator Section: Students may NOT use a calculator.

Decimal answers must be rounded to two decimal places unless otherwise directed.

(1) An elevator made the following trips: up 6 floors, then down 4 floors, then up 8 floors, then down 5 floors, then up 2 floors, and finally down 9 floors. If the elevator started on the 14th floor, on which floor did it end up?

(2) One serving of yogurt is 2/5 of a cup. Mario ate 1½ cups of yogurt. How many servings of yogurt did Mario eat?

(3) The data below are the number of points scored by the **Amazing Astros Basketball Team** in the last sixteen games. What is the **IQR** (Interquartile Range) for this set of data?
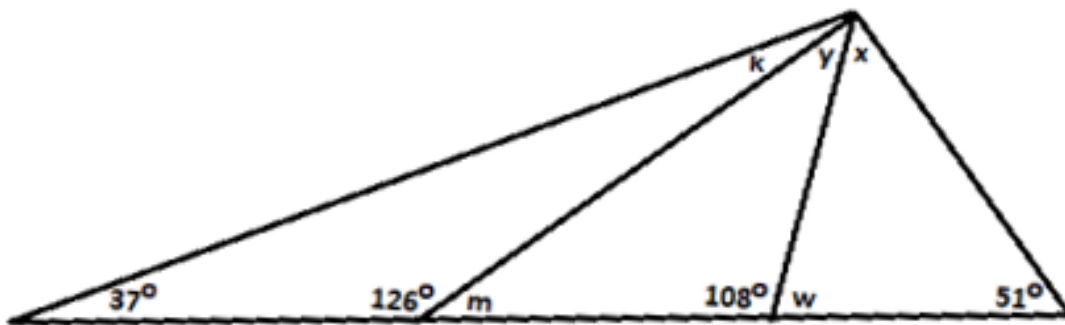
49   84   65   71   53   54   52   64   66   63   61   70   81   78   55   74

(4) A suit originally cost $94.99, but it is on sale for $83.99. What is the percent of decrease of the price of the suit? Round to the nearest percent.

(5) Simplify the following expression to a common fraction in lowest terms; *do not* use decimals in your computations.

$$\frac{(10 - 5)^2 + 24 \div 2^3 \times 5 - 7^0}{1/3}$$

(6) Find the measures of angles x, k, m, w, and y in the diagram below:

(7) Mary will use 75 gemstone beads and 90 crystal beads to make bracelets. The bracelets will all be the same.

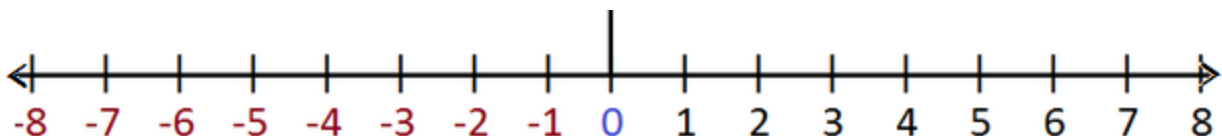(a) What is the greatest number of bracelets she can make?

(b) How many beads of each type are on each bracelet?

(8) Evaluate the following expression when **r = 3, w = -5, and h = -4**. Your final answer must be a mixed fraction in lowest terms.

$$\frac{(w - r)^2 + rh}{h/r}$$

(9) (a) Solve this inequality: **-3x + 5 > -16**   The domain on x is all Real numbers.

(b) Graph the solution set of the inequality on the single number line.

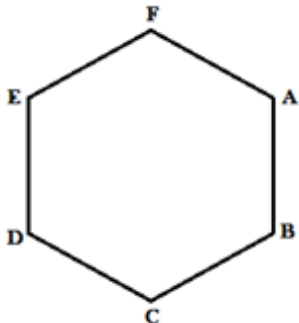-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8

(10) If a 26-foot tree casts an 18-foot shadow at the same time an apartment building casts a 60-foot shadow, how tall is the building?

(11) Given: two points W(-6, 11) and D(8,18). Find the linear equation representing Line WD. Write your answer in Slope-Intercept form.
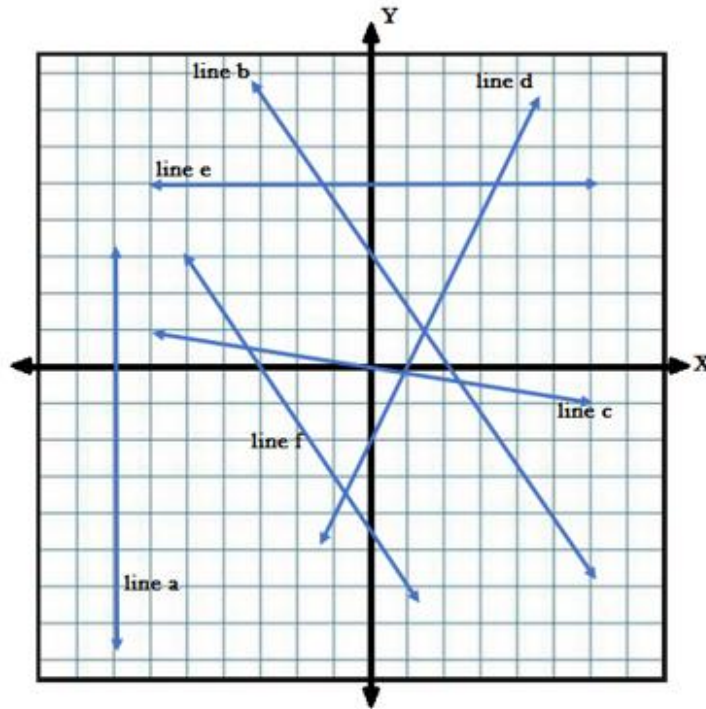
(12) Isabella can paint a deck in six hours, and her sister Elizabeth takes four hours to paint a deck with the same size. How long will it take the two sisters to paint the deck together?

(13) **Hexagon EFABCD** is a regular figure.(a) What is the sum of the *interior* angles (b) What is the measure of *each individual interior* angle?

(14) Complete the following questions using the graphs of linear equations in the diagram.

a) Which line represents an equation with a positive slope? _____

(b) Which lines are parallel? _____   (c) What is the slope? _____

(d) Which line has a slope of zero? _____

(e) Which line passes through the origin? _____

(f) Which line has an undefined slope? _____

STOP!

The teacher will collect the non-calculator section of the test.

Students will take a 1-minute stretch break (No talking please!)

(15) A bagel shop sells the following number of bagels over a 10-day period:

134, 114, 122, 141,   139, 141, 156, 125, 130, and 138 bagels per day.

Calculate the **mean absolute deviation** (MAD).

(16) At the **Rainbow Indoor Skating Arena**, there are two choices for paying for a visit:

Members: pay an initial cost of $80.00 and then $8.75 per visit

Non-members: pay $12.50 per visit.

How many times will a person have to go to the arena to skate so that the member cost and the non-member cost are equal?

(17) The equation for Line **s** is **y = -4/5 x + 3**. Line **t** contains the point (-6, -3) and is **perpendicular** to Line **s**. What is the equation for Line **t**? Write the equation in *Slope-Intercept* form.

(18) You want to save all the money you earn to buy an acoustic guitar that costs $540. At the *Dazzling Diner*, you are paid **$9.50** per hour and plan to work **12** hours each week for the next **five** weeks. Determine whether you will have earned enough money to purchase the guitar.

(19) A recipe for **Rockin' Raspberry Swizzle** calls for **4 3/8** cups of water for each cup of concentrate. If you use **5 1/3** cups of concentrate, how much water must be added to the mix?

(20) Antonio is building a square patio and will cover the patio with square tiles. Each tile has an area of 289 square inches and costs $2.49. Antonio has $600 to spend on tiles.

(a) How many tiles can Antonio buy?

(b) Find the side lengths (in feet) of the largest patio that Antonio can build.

(21) Arrange the integers beginning at **-3** and ending with **+5** in a ***Three by Three Magic Square*** so that all the rows, columns, and diagonals sum to **+3**.

STOP!

Your teacher will collect your test questions, scrap paper, and answer sheet.

(No talking please!)