MATHLETICS 8TH GRADE 2015

Team # _____

School: _____

Name: _____ Grade: _____

Name: _____ Grade: _____

Name: _____ Grade: _____

Question #1

2 minutes, 2 points

Note to GRADERS: Please keep this front page.

Problem 1 **2 points** **2 minutes**

When celebrating the Royal's American League Championship, your family purchased a cake. Four-fifths of the cake was eaten on the first day. The next day half of what was left was eaten by your family. If you split the cake that is left with your sibling, **what fractional amount of the whole cake did you eat the last day?**

ANSWER: _____

Adapted from: http://math.about.com/od/wordproblem1/ss/7wp.htm

MATHLETICS
8TH GRADE
2015

Team # _____

Question #2

2 minutes, 2 points

Problem 2 **2 points** **2 minutes**

Ty lives in Boston where they had a lot of snow this year (see picture). He and three of his friends are making snowballs to build a fort. Each person can build 15 snowballs in an hour, but the weather is warming up so 2 snowballs from each of their piles melt every 15 minutes. How long will it take them to make 140 snowballs to build their fort?

ANSWER: _____hrs.

Adapted from: http://math.about.com/od/wordproblem1/ss/7wp.htm

MATHLETICS
8TH GRADE
2015

Team # _____

Question #3
2 minutes, 2 points

Problem 3 **2 points** **2 minutes**

A mall parking lot holds 1,000 vehicles. Two-fifths of the parking spaces are for larger vehicles (trucks, large SUVs, etc.) and the rest of the spaces are for standard size cars. When you went to the mall, half of the large spaces were empty. The lot was ¾ full. How many standard size cars were in the lot?

ANSWER: _____

Adapted from: http://math.about.com/od/wordproblem1/ss/7wp.htm

MATHLETICS
8TH GRADE
2015

Team # _____

Question #4

3 minutes, 3 points

Problem 4 **3 points** **3 minutes**

Ahmed earns $1.50 for every video game he sells. When he sells one carton of 30 video games, he earns an additional $10. What is the minimum number of video games he has to sell in order to earn $450?

ANSWER: _____

Singapore Math Level 6: 70 Must-Know Word Problems, Frank Schaffer Publications,
www.FrankSchaffer.com

MATHLETICS
8TH GRADE
2015

Team # _____

Question #5
1 minute, 1 point

Problem 5 **1 point** **1 minute**

The sum of 4 consecutive even integers is 148.

What is the sum of the digits of the smallest of the 4 integers.

ANSWER: _____

http://themathleague.com/ml-files/grade_8_2012-13_contest.pdf

MATHLETICS
8TH GRADE
2015

Team # _____

Question #6

3 minutes, 3 points

Problem 6 **3 points** **3 minutes**

Find the **volume** of the composite shape to the nearest whole number.

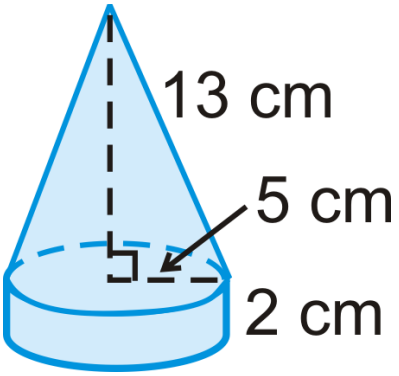
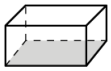
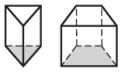
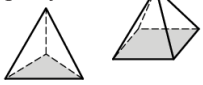


Figure	Formulas for Volume (V) and Surface Area (SA)
Rectangular Prism 	$V = lwh$ = length × width × height $SA = 2lw + 2hw + 2lh$ = 2(length × width) + 2(height × width) + 2(length × height)
General Prisms 	$V = Bh$ = area of base × height SA = sum of the areas of the faces
Right Circular Cylinder 	$V = Bh$ = area of base × height $SA = 2B + Ch$ = (2 × area of base) + (circumference × height)
Right Pyramid 	$V = \frac{1}{3}Bh = \frac{1}{3}$ × area of base × height $SA = B + \frac{1}{2}P\ell$ = area of base + ($\frac{1}{2}$ × perimeter of base × slant height)
Right Circular Cone 	$V = \frac{1}{3}Bh = \frac{1}{3}$ × area of base × height $SA = B + \frac{1}{2}C\ell$ = area of base + ($\frac{1}{2}$ × circumference × slant height)
Sphere 	$V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times$ cube of radius $SA = 4\pi r^2 = 4 \times \pi \times$ square of radius

ANSWER: _____cu. cm

MATHLETICS
8TH GRADE
2015

Team # _____

Question #7

3 minutes, 3 points

Problem 7 **3 points** **3 minutes**

On the island of Hawaii, the temperature is 87° F (Fahrenheit) at the beach when the temperature is 27° F at the summit of Mauna Kea, which is 13,800 feet above the beach. Assuming the temperature is a linear function of elevation above sea level, estimate the temperature in the city of Waimea, which is 11,130 feet below the summit of Mauna Kea.

ANSWER: _____° F

Mathematics Teaching in the Middle School, NCTM, Oct. 2014

MATHLETICS 8TH GRADE 2015

Team # _____

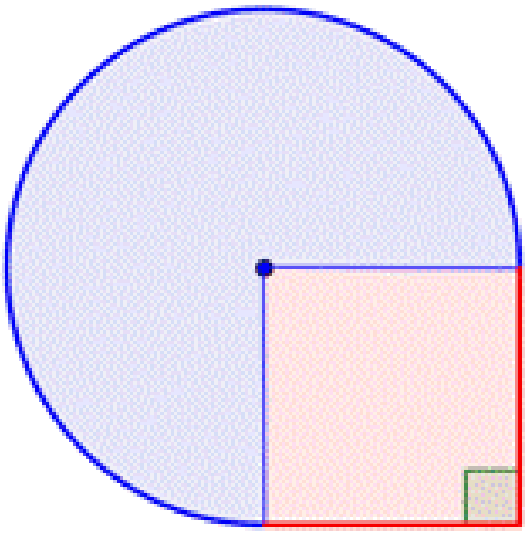
Question #8

2 minutes, 2 points

Problem 8 **2 points** **2 minutes**

Find the **area** of the composite shape to the nearest tenth.

The diameter of the circle is 7 meters.



ANSWER: _____

Diagram from google images at http://www.montereyinstitute.org/

MATHLETICS
8TH GRADE
2015

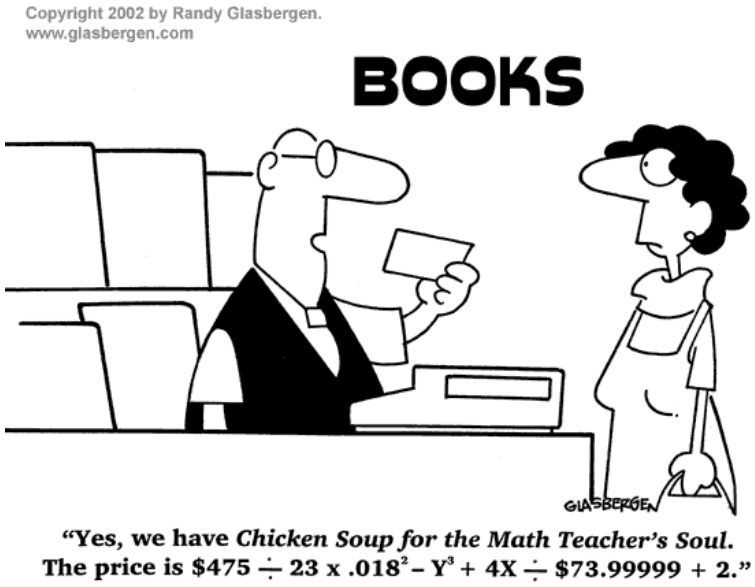
Team # _____

Question #9

2 minutes, 2 points

Problem 9 **2 points** **2 minutes**

Use the cartoon's problem to **solve for x**, when y = 0 and the cost of the book is $20.49. Round to the nearest hundredth.



"Yes, we have *Chicken Soup for the Math Teacher's Soul*. The price is $475 ÷ 23 x .018² – Y³ + 4X ÷ $73.99999 + 2."

ANSWER: _____

MATHLETICS
8TH GRADE
2015

Team # _____

Question #10
1 minute, 1 point

Problem 10 **1 point** **1 minute**

I am waiting in line with 10 people in front of me, including my brother. My brother has 10 people behind him in line, including me. If my brother is right in front of me, how many people are in line?

ANSWER: _____

http://themathleague.com/ml-files/grade_8_2012-13_contest.pdf

MATHLETICS
8TH GRADE
2015

Team # _____

Question #11

2 minutes, 2 points

Problem 11 **2 points** **2 minutes**

Solve the compound inequality:

$$-25 < -2(4x + 5) + 1 < 15$$

ANSWER: _____< x < _____

MATHLETICS
8TH GRADE
2015

Team # _____

Question #12

2 minutes, 2 points

Problem 12 **2 points** **2 minutes**

An arithmetic sequence has a **common difference, d**. Ex: 1, 4, 7, 10,…
A geometric sequence has a **common ratio, r**. Ex: 1, 2, 4, 8, 16,…
Determine which type of sequence you have and **determine the 16th term** in the sequence. Both formulas for finding the nth term are given:

Arithmetic nth term: $a_n = a_1 + (n - 1)d$

Geometric nth term: $a_n = a_1 \cdot r^{n-1}$

Where: a_n = *nth term,* a_1 = *1st term, n = # of term*

3, 6, 12, 24, 48,…

ANSWER: _____

A Problem Solving Approach to Mathematics for Elementary Teachers, Pearson Education, 2007.

MATHLETICS 8TH GRADE 2015

Team # _____

Question #13

2 minutes, 2 points

Problem 13 **2 points** **2 minutes**

The surface area of Earth is found by using the formula:

$$\boldsymbol{SA = 4\pi r^2.}$$

The radius of the earth is 3,959 miles.

The land area of Earth is approximately 5.75×10^7 miles.

The water area of the Earth is approximately 1.396×10^8 miles.

What is the probability that if a meteor hit the Earth, that the meteor would land in water? Round to the nearest percent.

ANSWER: _____%

A Problem Solving Approach to Mathematics for Elementary Teachers, Pearson Education, 2007.

MATHLETICS
8TH GRADE
2015

Team # _____

Question #14
1 minute, 1 point

Problem 14 **1 point** **1 minute**

The fourth power of :

$$\left(\sqrt{1+\sqrt{1+\sqrt{1}}}\right)$$

Is the same value as which of the following:

A. $\sqrt{2}+\sqrt{3}$

B. $\frac{1}{2}\left(7+3\sqrt{5}\right)$

C. $1+2\sqrt{3}$

D. $3+2\sqrt{2}$

ANSWER: _____

MATHLETICS
8TH GRADE
2015

Team # _____

Question #15

2 minutes, 2 points

Problem 15 **2 points** **2 minutes**

A collection of 5 positive integers has a mean of 4.4, a unique mode of 3, and a median of 4. If 8 is added to the collection, what is the **new median** of the 6 integers?

ANSWER: Median is _____

Mathematics Teaching in the Middle School, NCTM, March. 2015

MATHLETICS
8TH GRADE
2015

Team # _____

Question #16

2 minutes, 2 points

Problem 16 **2 points** **2 minutes**

Find the number:

Nine times a two-digit number is 3 greater than 5 times the same number with the digits reversed.

ANSWER: _____

Mathematics Teaching in the Middle School, NCTM, March. 2015

MATHLETICS
8TH GRADE
2015

Team # _____

Question #17

2 minutes, 2 points

Problem 17 **2 points** **2 minutes**

Montana Silversmiths is having a sale, and all merchandise is 50% off. Jenny uses a coupon for ½ off any one sale item, and she buys 4 identical bracelets. If she pays $136.50 for the 4 bracelets, how much does Jenny save during the sale?

ANSWER: _____

Mathematics Teaching in the Middle School, NCTM, March. 2015

MATHLETICS 8TH GRADE 2015

Team # _____

Question #18

1 minute, 1 point

Problem 18 **1 point** **1 minute**

What's the next line in the pattern?

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

ANSWER: _____ _____ _____ _____ _____ _____ _____

ANSWER KEY

#	PTS	Solutions
1	**2**	**1/20** 1 – 4/5 = 1/5; 1/5 x 1/2 = 1/10, split so 1/10 x 1/2 = 1/20
2	**2**	**5 hrs.** Each of 4 people: 15 – 8 per hour, netting 7 per person: 7 x 4 or 28 per hour 140/28 = 5 hours
3	**2**	**550 standard size cars** 1000 x 2/5 = 400. Half empty, so 200 trucks parked. ¾ x 1000 = 750, subtract the trucks = 550 cars
4	**3**	**247 games** Each carton of 30, Ahmed earns $55. $450/$55 = 8 r10 He needs to sell 8 cartons (240 games) and needs $10 more. He has to sell 7 more at $1.50 each to earn at least $10 more *(I disagree with book's answer of 246, 6 more would just give you $9)*
5	**1**	**7** The sum of 4 consecutive even integers is 148. Their average is 37. The 4 integers are 34, 36, 38, and 40. The sum of the digits of 34 is 7.
6	**3**	**471 cu.** Volume of Cone + Volume of Cylinder $\frac{1}{3}\pi r^2 h + \pi r^2 h = \frac{1}{3}\pi(5^2)(12) + \pi(5^2)(2) \approx 471.24 \approx 471$
7	**3**	**About 75º**
8	**2**	**41.1 sq. meters** A = ¾ $\pi(3.5)^2 + (3.5)^2$
9	**2**	**341.94**

10	**1**	**20** There are 9 people in front of my brother, and there are 9 people behind me. That's 18 people. Counting my brother and me, that's a total of 20 people in line.
11	**2**	**-3 < x < 2**
12	**2**	**98,304** $a_n = a_1 \cdot r^{n-1}$ $a_{16} = 3 \cdot 2^{16-1} = 98{,}304$
13	**2**	**71%** $SA = 4\pi r^2 = 4\pi(3959)^2 = 196{,}961{,}284.3$ Water/Total = 139,600,000/196,961,284.3 = .708 ≈ 71%
14	**1**	**D** $3 + 2\sqrt{2} \approx 5.8284$
15	**2**	**4.5** 3, 3, 4, 5, 7 Add 8 to make six numbers. 3, 3, 4, 5, 7, 8 Median is (4+5)/2 = 4.5
16	**2**	**12**
17	**2**	**$175.50**
18	**1**	**1 6 15 20 15 6 1** **Pascal's Triangle: Each number before and after 1 is the sum of the two directly above the number.** 1 1 1 1 2 1 1 3 3 1 1 4 6 4 1 1 5 10 10 5 1 1 6 15 20 15 6 1
	35	**TOTAL POINTS**