Name Key School _____

2014

Wahlert Math Club 8th Grade Math Contest

Individual Problem Solving Event

Calculators are permitted for this event. Write the final answer as a whole number or fraction in the space(s) provided. **DO NOT USE ANY REPEATING DECIMALS IN YOUR ANSWERS.** Each problem is worth 3 points.

_____0.8 ft_____1. Joshua gets a 6.5 ft ladder and places the top of the ladder against a wall 6 ft from the ground. After the ladder slips down the wall 0.4 ft, how far will the foot of the ladder move?

_____18_____2. Lauren noticed that if she subtracted 17 times her age 17 years ago from her age 17 years from now, the result would be her current age. How old is Lauren now?

_____8_____3. Let the operation @ be defined as follows:

$$a \text{ @ } b = \frac{b^2}{a} \text{ for } a \neq 0$$

If $(a \text{ @ } 2) \text{ @ } 6 = 72$ what is the value of a?

____32/3_____4. If 4 tablespoons equal ¼ cup, how many tablespoons equal ⅔ cup?

_____11;40_____ 5. Cassidy had an appointment at 1:00 p.m. at a location 50 miles from home. Driving at the speed limit of 30 mph, she arrived 20 minutes late. At what time did Cassidy leave the house?

_____3_____ 6. The sum of a positive real number and six times its reciprocal is equal to its cube. What is the square of the number?

_____1____ 7. In football, points are awarded as follows: 2 points for a safety, 3 points for a field goal, 6 points for a touchdown, 1 point for a kicked conversion after a touchdown, and 2 points for a run or pass conversion after a touchdown. What are the only natural numbers less than 45 points that cannot be a team's total score in a football game?

_____6____ 8. The average of 5 quiz grades is 10. When the lowest grade is dropped, and the new average is calculated, the average is 11. What was the score of the dropped grade?

____2520_____ 9. What is the smallest natural number divisible by eachof the integers 1 – 10 inclusive?

_____97_____ 10. The sum of nineteen consecutive integers is 2014. What is the smallest of the integers?

2014 Marathon Key

Math Contest.

1	d
2	e
3	a
4	c
5	e
6	a
7	c
8	b
9	c
10	a
11	c
12	e
13	b
14	b
15	d
16	a
17	a
18	d
19	e
20.	c
21	d
22	a
23	e
24	b
25	c
26	b

27. a
28. b
29. d
30. b
31. c

2014

Wahlert Math Club 8th Grade Math Contest

Team Problem Solving Event

School _____ Team Members

_____

_____

_____

_____

_____

Calculators may be used on this event. **Use no decimal approximations or repeating decimals in answers. Write all fractions in lowest terms.** Write each answer in the space provided. Each problem is worth 10 points.

1. By factoring each term, find a rule for the following sequence and write the next term in the sequence.

16, 24, 40,56, 88

_____104_____

2. How many overlapping right isosceles triangles with hypotenuse length 2 units does it take to fill a square with area 8 square units?

_____8_____

3. How many times in a 24-hour day are the minute hand and the hour hand of a clock perpendicular to each other?

_____44_____

4. The line *l* passes through the points (0, 1) and (6, 5). What is the y-intercept of the line *K* if *K* is perpendicular to *l* and passes through the point (2, 4)?

_____7_____

5. How many seven-digit numbers of the form $a34567b$ are divisible by 11? (Note: a and b represent single digits.)

_____8_____

6. Then opening enrollment at Jackson High School increased by 48 students in the first week of September. In the second week, the total enrollment decreased by 5%. If 1216 students were enrolled at the end of the second week, what was the opening day enrollment?

_____1232_____

7. A box containing an aluminum block weighs 8 pounds. When a steel block weighing 3 times the weight of the aluminum block replaces the aluminum block inside the box, the weight is 20 pounds. What is the weight of the box?

_____2 lbs_____

8. In how many three-digit numbers are at least two of the digits the same?

_____252_____

9. The symbol # is defined as an arithmetic operation using the rule below.

10 # 5 = 9

11 # 6 = 7

13 # 8 = 3

Find 6 # 3.

_____15_____

10. How many ways can be found to make change equivalent to one dollar using only nickels, dimes, and quarters? You do not need at least one coin of each denomination.

_____29_____