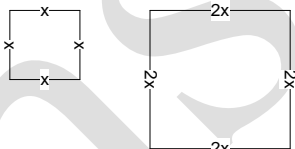# Oklahoma School of Science and Mathematics
## Eleventh Annual Middle School Mathematics Contest
### Round One, Spring 2014

Name: _____

Directions: Write the answer to each question in the box to the right. Units are given in plural form even if the singular form is correct. Use the scratch paper provided to do your work. Calculators are allowed, but not necessary.

Fractions should be in simplest form $\left(\frac{3}{2} \; not \; 1\frac{1}{2}\right)$ and lowest terms $\left(\frac{3}{2} \; not \; \frac{6}{4}\right)$.

| # | Question | Answer |
|---|----------|--------|
| 1. | Express the decimal sum as a reduced fraction.    $0.45 + 0.305 + 0.05$ | 1.   $\dfrac{161}{200}$ |
| 2. | Express the reciprocal of $\dfrac{6}{12}$ as a percentage. | 2.   200% |
| 3. | Which number is closer to zero, $-\dfrac{4}{5}$ or $\dfrac{5}{4}$ ? | 3.   $-\dfrac{4}{5}$ |
| 4. | $a \times b = 30$ and $c \times d = 4$   Calculate $a \times b \times c \times d$ . | 4.   120 |
| 5. | What is one half of the reciprocal of $\dfrac{4}{1,000}$ ? | 5.   125 |
| 6. | If $a = 99$ and $b = 4$ , find the remainder of the division $\dfrac{a}{b}$ . | 6.   3 |
| 7. | In the two squares shown, the perimeter increases 100% from the smaller to the larger square.  What is the percentage increase in area?  | 7.   300% |
| 8. | How much greater is $1+2+3+4+5+6+7+8+9+10$ than $1+2+3+4+5$ ? | 8.   40 |
| 9. | What is $x+2+x+2+x+2+x+2+x+2+x+2$ if x is equal to 7? | 9.   54 |
| 10. | Which of these numbers is the smallest?<br>a.  0.66      b.  6/10      c.  66/100     d.  13/20 | 10.  Circle one<br>a  [b]  c  d |
| 11. | Solve for $x$ :  $12x - 6x = 3$ | 11.   $x = \dfrac{1}{2}$ |
| 12. | What is the Greatest Common Divisor of 48 and 72? | 12.  24 |
| 13. | In the triangle below, one angle measures $72^{\circ}$ .  What is the sum, of the other two angles?<br>a.  72°      b.  108°      c.  110°     d.  144°     e.  288°  | 13.  Circle one:<br>a  [b]  c  d  e |

| | | |
|---|---|---|
| 14. | Before you are able to take a bite of your chocolate bar, a friend comes along and takes ¼ of the bar. Then another friend comes along, and takes ⅓ of what is left. You quickly eat the remainder before anyone else comes by. How much of the original chocolate bar did you get to eat? | 14. $\dfrac{1}{2}$ |
| 15. | Radius of the two circles are 5, and 3, find the area of the dark part in the figure?  | 15. $16\pi$ |
| 16. | Solve for x: $2(x-1)=3(x+2)$ | 16. $x=-8$ |
| 17. | If $a \oplus b = ab - b$, compute $5 \oplus (2 \oplus 3)$. | 17. 12 |
| 18. | Solve the equation for x: $(2x+2)+(3x+3)+(4x+6)=2009$ | 18. 222 |
| 19. | Sam traveled 20 Km in one day. This represents $\dfrac{4}{7}$ of his total trip. What is the total length of his trip? (in Km) | 19. 35 Km |
| 20. | How many students do we have in a class if the number of boys is 3 times the number of girls and if 4 girls will join the class and 4 boys will leave then the number of boys becomes twice the number of girls? | 20. 48 |
| 21. | Evaluate: $2^0 \times 3^3 \times 5^0 \times 7^{-2} \times 11$ <br> a. $\dfrac{50}{49}$    b. $\dfrac{297}{49}$    c. $\dfrac{348}{49}$    d. $\dfrac{497}{49}$    e. $\dfrac{989}{49}$ | 21. Circle one: <br> a **b** c d e |
| 22. | Combine over a common denominator $\dfrac{1}{a}+\dfrac{2}{3a}+3$. | 22. $\dfrac{9a+5}{3a}$ |
| 23. | Given $x \otimes y = \dfrac{\left(x^3 - y^3\right)}{x^2 y}$ find $7 \otimes 4$. Express your answer as a fraction. | 23. $\dfrac{279}{196}$ |
| 24. | In a warehouse there are 563 kilograms of wheat. After we put an equal amount of wheat in several containers there are 143 kilograms remaining. If we add 5 kilograms more into each container there are 3 kilograms remaining. How much wheat is in each container (including the original amount and the five kilograms)? | 24. 20 kg |
| 25. | The sum of 4 consecutive integers is 2,174. What is the smallest of the four integers? | 25. 542 |
| 26. | Which of these numbers is odd? <br> a. $1^{2010}+1$ <br> b. $2014^2+1$ <br> c. $11^5+13$ <br> d. $7^4+7$ | 26. Circle one: <br> a **b** c d |