Dick Schaff Math Superbowl XLII
Level 1: 7^{th} Grade Blitz – 2015

Directions: (1) Select the most correct answer for each question and mark it on your answer form.
(2) No calculators of any sort are allowed.
(3) Note that N.O.T. means "None of these."

1. Simplify the following expression: $10(1+3)-8\cdot 3$

   a) 6 b) 96 c) 18 d) 16 e) N.O.T.

2. Compute the following: $5\frac{3}{8}-2\frac{7}{8}$

   a) $3\frac{1}{2}$ b) $3\frac{1}{4}$ c) $2\frac{1}{2}$ d) $2\frac{1}{4}$ e) N.O.T.

3. Tom rolls two six-sided dice, one red and one blue. What is the probability that he will roll a 2 on the red die and a 5 on the blue die?

   a) $\frac{1}{6}$ b) $\frac{1}{10}$ c) $\frac{1}{3}$ d) $\frac{1}{36}$ e) N.O.T.

4. An architect is planning a triangular pool with a perimeter of 108 feet. If two of the sides measure 56 and 22 feet respectively, what is the length of the third side?

   a) 20 feet b) 30 feet c) 32 feet d) 38 feet e) N.O.T.

5. As a mixed number, 240% is equal to

   a) 24 b) 240 c) $2\frac{4}{5}$ d) $4\frac{4}{5}$ e) N.O.T.

6. The ratio (by volume) of sand to peat moss in a certain sample of soil is 2 to 7. If the total volume of the soil is 180 cubic feet, what is the volume of sand in the soil (in cubic feet)?

   a) 20 b) 40 c) 90 d) 140 e) N.O.T.

7. You have won a \$1,000 prize in a local contest. If you save your winnings in an investment that has a 4.5% annual interest rate, how much interest will you have earned in one year?

   a) \$45.00 b) \$4.50 c) \$1,004.50 d) \$1,045.00 e) N.O.T.

8. A restaurant owner spends \$912 for 75 pounds of produce. Which equation could you use to find the price per pound?

   a) $912(75)=x$ b) $912=\frac{75}{x}$ c) $912=75+x$ d) $912=75x$ e) N.O.T.

9. Evaluate $5ab \div c$ if $a = 4$, $b = 6$, and $c = -3$.

a) 12 b) -117 c) -40 d) -8 e) N.O.T.

10. A table top is in the shape of an equilateral triangle. If the table top's perimeter is 420 cm, what is the length of one side of the table?

a) 140 cm b) 105 cm c) 210 cm d) 420 cm e) N.O.T.

11. Simplify the following expression: $8(x + 3) + (9 - 5)$

a) $28x$ b) $24x + 4$ c) $8x + 28$ d) $11x + 4$ e) N.O.T.

12. Sarah wraps presents at a local gift shop. If it takes 1.4 meters of ribbon to wrap a present, what is the largest number of presents that she can wrap if she has 40 meters of ribbon?

a) 28 b) 29 c) 30 d) 31 e) N.O.T.

13. In 1954, Great Britain's Diane Leather was the first to break the 5-minute mile in women's track and field. Assuming that she ran at a constant speed, if her time for the mile was 4:59.6, what would her time have been at the half-mile mark?

a) 2:30.3 b) 2:29.8 c) 9:59.2 d) 8:30.6 e) N.O.T.

14. A shirt that regularly sells for \$45.00 is on sale for 20% off. What is the sale price of the shirt?

a) \$54.00 b) \$36.00 c) \$25.00 d) \$9.00 e) N.O.T.

15. A circular mirror has a diameter of 12 inches. What is the area, in square inches, of the mirror?

a) 6π b) 12π c) 72π d) 144π e) N.O.T.

16. The number of parts produced by three different machines are shown in the table.

Minutes	Parts Made by Machine X	Parts Made by Machine Y	Parts Made by Machine Z
1	9	8	6
3	18	24	18
9	27	72	52

Only one of the machines produces parts at a constant rate. Determine this constant rate.

a) 3 parts per minute b) 6 parts per minute
c) 8 parts per minute d) 9 parts per minute
e) N.O.T.

17. Rebecca buys some scarves that cost \$5 each and two purses that cost \$12 each. The cost of Rebecca's total purchase is \$39. What equation can be used to find n, the number of scarves that Rebecca buys?

a) $5 + 24n = 39$
b) $(24 + 5)n = 39$
c) $5n + 24 = 39$
d) $(24 \cdot 5) + n = 39$
e) N.O.T.

18. If Donna walks 1/2 mile in a quarter of an hour and Bob walks 1/3 mile in the same time period, how many miles have Donna and Bob walked together in 3 hours?

a) $1\frac{1}{3}$ miles
b) 4 miles
c) 6 miles
d) 10 miles
e) N.O.T.

19. A student draws a tree using a scale of 2 cm = 4 feet. Find the actual height of the tree if the image measures 5.6 cm tall.

a) 11.2 feet
b) 22.4 feet
c) 33.6 feet
d) 44.8 feet
e) N.O.T.

20. A rectangular garden has an area of 384 square feet. The length of the garden is 24 feet. What is the width of the garden?

a) 20 feet
b) 18 feet
c) 14 feet
d) Cannot be determined
e) N.O.T.

21. Angles F and G are complementary angles. Angles G and H are supplementary angles. The degree measure of each angle is a whole number. What is the smallest possible measure of angle H?

a) 1°
b) 89°
c) 91°
d) 179°
e) N.O.T.

22. Compute $-1\frac{1}{5} \div (-1\frac{5}{6})$.

a) $\frac{11}{5}$
b) $\frac{36}{55}$
c) $-\frac{36}{55}$
d) $-\frac{11}{5}$
e) N.O.T.

23. $5^4 + 5^4 + 5^4 + 5^4 + 5^4 =$

a) 25^4
b) 5^{20}
c) 25^{20}
d) 5^5
e) N.O.T.

24. Every factor of 12 is also a factor of which of the following numbers?

a) 18
b) 20
c) 6
d) 30
e) N.O.T.

25. A spinner is designed to have two scoring areas, one of which is worth 5 points, and the other is worth 7 points. If an unlimited number of spins are allowed, what is the largest finite score that cannot be attained?

a) 13 b) 16 c) 23 d) 26 e) N.O.T.

26. What is the probability of a 70% basketball free throw shooter making three consecutive free throws? Assume that the free throws are independent.

a) 34.3% b) 49% c) 70% d) 210% e) N.O.T.

27. The units digit of $37^{2015} - 19^{2015}$ is

a) 2 b) 4 c) 6 d) 8 e) N.O.T.

28. Which steps can be used to solve for the value of y in the equation $\frac{2}{3}(y + 67) = 143$?

a) Divide both sides by $\frac{2}{3}$, then subtract 67 from both sides.
b) Subtract 67 from both sides, then divide both sides by $\frac{2}{3}$.
c) Multiply both sides by $\frac{2}{3}$, then subtract 67 from both sides.
d) Subtract $\frac{2}{3}$ from both sides, then subtract 67 from both sides.
e) N.O.T.

29. The sum of the reciprocals of all of the positive factors of 18 is

a) $\frac{7}{6}$ b) $\frac{14}{9}$ c) $\frac{5}{3}$ d) $\frac{13}{6}$ e) N.O.T.

30. Which of the following is true?

a) $x^4x^5 = x^{20}$ b) $(y + 7)^2 = y^2 + 49$
c) $\sqrt{x^2 + 16} = x + 4$ d) $5(xy) = (5x)(5y)$ e) N.O.T.

31. Judy bought a car for x dollars. One year later, the value of the car was $0.76x$ dollars. Which expression is another way to describe the change in the value of the car?

a) 0.24% decrease b) 0.76% decrease c) 24% decrease
d) 76% decrease e) N.O.T.

32. A crew of highway workers paved $\frac{2}{15}$ mile in 20 minutes. If they work at the same rate, what portion of a mile will they pave in one hour?

a) $\frac{1}{150}$ b) $\frac{2}{45}$ c) $\frac{2}{5}$ d) $\frac{5}{2}$ e) N.O.T.

33. A triangle with side lengths $5x$, $12x$, and $13x$ is a right triangle. What is its area?

a) $25x^2$ b) $60x^2$ c) $65x^2$ d) $156x^2$ e) N.O.T.

34. $(-3)^2 \times (-2)^3 \times (-1)^4 =$

a) 36 b) -36 c) 72 d) -72 e) N.O.T.

35. Mr. Fletcher has a box containing bags of different types of chips. The number of bags and types of chips are shown in the table below.

Type of Chips	Number of Bags
plain	3
corn	8
nacho	5
cheddar	4

He will randomly give one bag of chips to each of his 20 students. Nelson is a student in Mr. Fletcher's class. Which statement about the likelihood of Nelson receiving different types of chips is true?

a) Nelson is less likely to receive either plain or nacho chips than cheddar chips.

b) Nelson is twice as likely to receive cheddar chips as he is to receive corn chips.

c) Nelson is equally as likely to receive corn chips as he is to receive either plain or nacho chips.

d) Nelson is more likely to receive nacho chips than plain chips and less likely to receive nacho chips than cheddar chips.

e) N.O.T.

36. Which of the following expressions is equivalent to $(2t - 8) - \frac{1}{2}(9 - 4t) + \frac{5}{2}$?

a) $-2t - 1$ b) $-2t - 10$ c) $4t - 1$ d) $4t - 10$ e) N.O.T.

37. In Mrs. Morales' class, the ratio of boys to girls is $3 : 7$. The class sizes at Mrs. Morales' school range from 22 to 34 students per class. What is the total number of students in Mrs. Morales' class?

a) 30 students b) 28 students c) 24 students d) 21 students e) N.O.T.

38. The circumference of Sarah's circular table is 72π inches. What is the radius of the table?

a) 18 inches b) 32 inches c) 72 inches d) 144 inches e) N.O.T.

39. The cost of a toy car is \$20 less than two times the cost of a toy train. If the cost of the toy car is \$100, what is the cost of the train?

a) \$60 b) \$180 c) \$80 d) \$220 e) N.O.T.

40. In how many different ways can the five vowels in the alphabet be arranged so that each vowel is used exactly once?

a) 5 b) 120 c) 720 d) 3125 e) N.O.T.

41. Which number line shows the solution to the inequality $-3x - 5 < -2$?

a) 

b) 

c) 

d) 

e) N.O.T.

42. Jonathan bought a package of baseball cards at the local store. He put half of the cards in his room and took the other half to his friend Kendall's house. While there, Jonathan gave one fourth of the cards he had with him to Kendall. He then gave two of his remaining cards to Kendall's cousin. At that point, Jonathan had ten cards left with him while at Kendall's house. How many cards did Jonathan originally buy at the store?

a) 8 b) 16 c) 24 d) 32 e) N.O.T.

43. What is the largest prime factor of 42?

a) 1 b) 2 c) 3 d) 5 e) N.O.T.

44. Simplify $7 - 3[4 - (2 - 5)^2]$.

a) 22 b) -8 c) 46 d) -32 e) N.O.T.

45. Emily typed 110 words in $2\frac{3}{4}$ minutes. At this rate, how many words can she type in $4\frac{1}{4}$ minutes?

a) 71 words b) 165 words c) 170 words d) 255 words e) N.O.T.