2004-2005 TMSCA Middle School Mathematics Championship Meet Test

1. $4\frac{2}{3} \times 3.125 =$ _____.

A. $15\frac{7}{8}$ B. $14\frac{5}{12}$ C. $15\frac{3}{8}$ D. $14\frac{7}{12}$ E. NOT

2. Choose the expression that is not equivalent to $\frac{3}{4}$.

A. $\left(\frac{4}{3}\right)^{-1}$ B. $\frac{450}{600}$ C. $3 \times 16^{\frac{1}{2}}$ D. $3 \times 16^{-\frac{1}{2}}$ E. NOT

3. Find the measure of an exterior angle of a regular nonagon.

A. 140° B. 180° C. 40° D. 45° E. NO

4. Given a triangle with two angle measures of 53.6° and 72.8°, classify the triangle formed.

A. acute isosceles B. obtuse isosceles C. right isosceles D. acute scalene E. NOT

5. Find the product of 238.3 and 14.5.

A. 3,453.55 B. 3,355.55 C. 3,455.35 D. 3,453.35 E. NOT

6. If the lower quartile of a set of data is 22 and the upper quartile is 32, find the limits of the outliers.

A. 22, 32 B. 12, 42 C. 7, 47 D. 17, 37 E. NOT

7. $0.00024567 =$ _____ *(scientific notation)*

A. 2.45×10^{-4} B. 0.24567×10^{3} C. 2.4567×10^{-4} D. 2.4567×10^{4} E. NOT

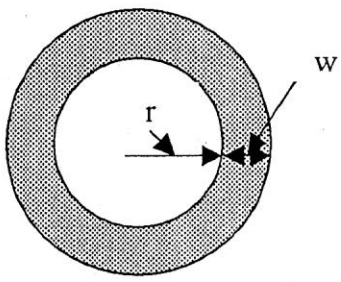
8. Which set of line segments could not form a right triangle?

A. 3, 5, 4 B. 20, 25, 15 C. 7, 25, 24 D. 17, 9, 15 E. NOT

9. In a circle, an 80° central angle cuts off an arc of 3 cm. What is the circumference of the circle?

A. $13\frac{1}{4}$ B. 13.7 C. $13\frac{1}{5}$ D. $13\frac{1}{2}$ E. NOT

10. In the figure to the right, find the radius r if the width w of the shaded region is 2 cm and the shaded area is 176 cm^2. Use $\frac{22}{7}$ for π.



A. 12 B. 13
C. 14 D. 15
E. NOT

11. Simplify: $\left(\frac{1}{2}x^4\right)^2\left(\frac{2}{5}x^3\right)$

A. $\frac{1}{10}x^{19}$ B. $\frac{1}{5}x^{11}$ C. $\frac{1}{10}x^{11}$ D. $\frac{1}{5}x^{19}$ E. NOT

12. Two snails leave a point traveling in opposite directions . One is averaging 6 inches per hour more than the other . If they are 18 inches apart after 1.5 hours, what is the rate of the faster snail?

A. 3 in/hr B. 6 in/hr C. 9 in/hr D. 12 in/hr E. NOT

13. $2\frac{1}{3}+4\frac{1}{4}+\frac{7}{8}=$ _____.

A. $6\frac{11}{12}$ B. $7\frac{11}{24}$ C. $6\frac{11}{24}$ D. $7\frac{1}{24}$ E. NOT

14. Find the LCM for $3a^2$, $6a^3$, and $9a^4$.

A. $36a$ B. $18a^{24}$ C. $9a^4$ D. $18a^4$ E. NOT

15. Two numbers have an LCM of $3\times5^2\times7$. Their GCF is 5. If one of the numbers is 3×5^2, what is the other number?

A. $3^2\times5$ B. 3×5 C. 5^2 D. 5×7 E. NOT

16. Which of the following numbers: 2, 3, 5, 7, 9, or 10, will divide into 196 evenly?

A. 2, 3, 9 B. 2, 5, 7 C. 2, 7 D. 2, 7, 9 E. NOT

17. Simplify: $\dfrac{a^b}{a^{a-b}}$

A. a^{a-2b} B. a^a C. a^b D. a^{2b-a} E. NOT

18. Evaluate $6t^{-2}$ for $t=-3$.

A. $\frac{2}{3}$ B. 6 C. $\frac{3}{2}$ D. $-\frac{2}{3}$ E. NOT

19. $8.25\div\frac{3}{8}=$ _____

A. 21 B. $22\frac{1}{8}$ C. $21\frac{7}{8}$ D. 22 E. NOT

20. For best performance, 0.91 to 0.93 of a rocket's total mass should be propellant. The mass fraction (MF) is expressed as $MF=\dfrac{mass\ of\ propellant}{total\ mass}$. If a rocket's total mass is 6000 pounds, which of these amounts of propellant would fall in the range for best performance?

A. 5,800 pounds B. 5,000 pounds C. 5,500 pounds D. 5,700 pounds E. NOT

21. The fastest monarch butterfly can fly $\frac{1}{3}$ mile in one minute. How far can this same butterfly travel in $\frac{1}{2}$ minute?

A. 720 ft B. 880 ft C. 1,760 ft D. 2,640 ft E. NOT

22. Find the difference between the mean and the mode for the following set of data: 2, 2, 4, 2, 5, 3

A. 3 B. 1 C. 2 D. 0 E. NOT

23. Solve the following inequality: $\dfrac{t}{-4.3}\geq5$

A. $t\geq-21.5$ B. $t<-20.5$ C. $-21.5\leq t$ D. $t\leq-20.5$ E. NOT

24. A dodecagonal pyramid has _____ edges.

A. 36 B. 24 C. 25 D. 22 E. NOT

25. Simplify: $7[5+(13-4)\div 3]$

A. $32\frac{2}{3}$ B. 56 C. 38 D. $14\frac{2}{3}$ E. NOT

26. The force of gravity on Earth is approximately six times greater than on the moon. As a result, objects on the moon weigh six times as much on Earth as they do on the moon. If an object weighs 34 pounds on the Earth, how much does it weigh on the moon?

A. 204 lbs B. 194 lbs. C. $5\frac{2}{3}$ lbs D. $6\frac{1}{3}$ lbs E. NOT

27. $\frac{5}{6}$ mile = _____ feet

A. 4,444 B. 4,400 C. 4,333 D. 4,250 E. NOT

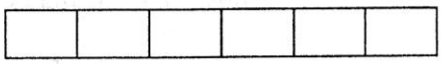
28. Which expression represents $(y+9)+8$ rewritten using the Associative Property?

A. $8+(y+9)$ B. $8y+72$ C. $y+(9+8)$ D. $72y$ E. NOT

29. In volleyball, the net is $3\frac{1}{4}$ feet tall and the bottom of the net is $4\frac{2}{3}$ feet from the floor. Find the distance from the top of the net to the floor.

A. 8 ft B. 7 ft 11 in C. 8 ft 1 in D. 7 ft 9in E. NOT

30. What is the total number of rectangles, of all sizes, in the figure to the right?



A 9 B. 21 C. 18 D. 6 E. NOT

31. If the length and width of a rectangle are both tripled, the perimeter is increased by:

A. 3 times B. 9 times C. 6 times D. 27 times E. NOT

32. A roll of dental floss contains 8.75 feet of floss. How many inches are on the roll?

A. 110 inches B. 105 inches C. 95 inches D. 96.75 inches E. NOT

33. Which one of the following pairs of numbers contains two numbers that are both relatively prime and composite?

A. 5, 7 B. 9, 12 C. 11, 12 D. 4, 9 E. NOT

34. A model airplane has a wingspan of 27 inches. The full-sized aircraft has a wingspan of 36 feet. Which of the following expresses the scale of the model plane to the actual plane?

A. $\frac{1\ inch}{8\ inches}$ B. $\frac{1\ inch}{16\ inches}$ C. $\frac{3\ inches}{4\ inches}$ D. $\frac{2\ inches}{9\ inches}$ E. NOT

35. A mass of 18 g and a mass of 22 g are on the ends of a meter stick. How far should a fulcrum be placed from the 18 g mass to balance the meter stick?

A. 0.45 m B. 0.50 m C. 0.55 D. 0.60 m E. NOT

36. $33\frac{1}{3}\% + 0.8\overline{3} + \frac{1}{2} =$ _____

A. $\frac{4}{-}$ B. 1.4 C. $\frac{5}{-}$ D. 1.5 E. NOT

37. At its farthest, the moon is about $4.07 \times 10^5 km$ from Earth. At its closest, it is about $3.56 \times 10^5 km$ from Earth. Find the difference between the two distances.
A. 0.51 B. 5.1×10^5 C. 5.1×10^4 D. 5.1 E. NOT

38. If $\Delta ABC \sim \Delta BCA$, then ΔABC is:
A. scalene B. right C. equilateral D. obtuse E. NOT

39. 24% of 54 = _____% of 216.
A. 12 B. 18 C. 4 D. 6 E. NOT

40. Simplify: $3\sqrt{2} \cdot 4\sqrt{18} =$ _____
A. 24 B. 72 C. $12\sqrt{20}$ D. $7\sqrt{20}$ E. NOT

41. Which of the following is the equation of the parent function for all linear functions?
A. $y = x^2$ B. $y = 2x$ C. $y = x$ D. $y = x + 2$ E. NOT

42. $12\ ft^2 =$ _____ in^2
A. 1,728 B. 288 C. 864 D. 216 E. NOT

43. One number is 4 less than eleven times another. The sum of the two numbers is 92. Find the numbers.
A. 8 and 84 B. 4 and 40 C. 30 and 62 D. 6 and 62 E. NOT

44. Find the slope of the line whose equation is $2x + 5y = 10$.
A. $\frac{5}{2}$ B. $-\frac{2}{5}$ C. $-\frac{5}{2}$ D. $\frac{2}{5}$ E. NOT

45. What is the area of the largest square that can be cut from a circular piece of plywood with a radius of 12?
A. 288 B. 72 C. 144 D. 48 E. NOT

46. Write an equation in slope-intercept form for a line with a y-intercept of -5 and a x-intercept of 3.
A. $y = \frac{3}{5}x + 5$ B. $y = \frac{5}{3}x - 5$ C. $y = -\frac{3}{5} - 5$ D. $y = \frac{3}{5}x + 3$
E. NOT

47. $14.53 + 0.0023 + 19 =$ _____
A. 56.53 B. 33.76 C. 14.5342 D. 33.5323 E. NOT

48. *MCMLIV* = _____ *Arabic Number*
A. 2155 B. 1995 C. 1955 D. 1959 E. NOT

49. $342_5 =$ _____$_{10}$
A. 97 B. 37 C. 92 D. 82 E. NOT

50. Solve: $2x = 3x$
A. $x = \frac{3}{2}$ B. $x = \frac{2}{3}$ C. $x = -\frac{3}{2}$ D. $x = 0$ E. NOT

2004-2005 TMSCA Middle School Mathematics Test
Championship Meet Key

1.	B	21.	B	41.	C
2.	C	22.	B	42.	A
3.	C	23.	E ($t \leq -21.5$)	43.	A
4.	A	24.	B	44.	B
5.	C	25.	B	45.	A
6.	C	26.	C	46.	B
7.	C	27.	B	47.	D
8.	D	28.	C	48.	E (1954)
9.	D	29.	B	49.	A
10.	B	30.	B	50.	D
11.	C	31.	A		
12.	C	32.	B		
13.	B	33.	D		
14.	D	34.	B		
15.	D	35.	C		
16.	C	36.	C		
17.	D	37.	C		
18.	A	38.	C		
19.	D	39.	D		
20.	C	40.	B		