2005-2006 TMSCA Middle School Mathematics Test #5

1. $12-5\frac{11}{12}=$ _____.

   A. $7\frac{11}{12}$ B. $7\frac{1}{12}$ C. $6\frac{1}{12}$ D. $4\frac{11}{12}$ E. NOT

2. $12.09-0.089+1.5=$ _____.

   A. 10.501 B. 12.7 C. 13.51 D. 13.501 E. NOT

3. Vertical angles are always:

   A. complementary B. supplementary C. right angles D. adjacent E. NOT

4. Simplify: $-12-4-[-(-6)+12]$.

   A. −22 B. −28 C. 22 D. −34 E. NOT

5. Which fraction is greater than $-\frac{4}{7}$?

   A. $-\frac{11}{20}$ B. $-\frac{7}{8}$ C. $-\frac{13}{14}$ D. $-\frac{2}{3}$ E. NOT

6. Find the median of the supplement and complement of a 55° angle.

   A. 80 B. 35 C. 125 D. 160 E. NOT

7. Write 0.000304 in scientific notation.

   A. 304×10^{4} B. -3.4×10^{-5} C. 3.04×10^{-4} D. 3.04×10^{5} E. NOT

8. Simplify: $47(44+31)-23(24+51)$

   A. 1,250 B. 1,800 C. 1,600 D. 1,750 E. NOT

9. Simplify: $\frac{y^{3}x^{18}}{y^{-2}x^{-6}}$.

   A. $y^{5}x^{24}$ B. yx^{12} C. $y^{-6}x^{-108}$ D. $y^{24}x^{5}$ E. NOT

10. Out of 100 people surveyed, 20 didn't own a pet, 67 had a dog and 71 had a cat. How many surveyed had both a dog and a cat?

    A. 4 B. 58 C. 33 D. 29 E. NOT

11. Choose the true statement about the data: 42, 38, 51, 42, 52.

    A. range = 16 B. mean < mode C. mode > median D. mean = median E. NOT

12. $z^{-5}\cdot$ _____ $=z^{15}$.

    A. z^{-3} B. z^{3} C. z^{20} D. z^{-12} E. NOT

13. 8.45 kg = _____ mg.

    A. 845 B. 84.5 C. 8,450 D. 845,000 E. NOT

14. $2\frac{4}{15}\times3\frac{1}{3}=$ _____.

    A. $7\frac{4}{15}$ B. $7\frac{5}{9}$ C. $8\frac{4}{15}$ D. $7\frac{7}{15}$ E. NOT

15. How many liters of water must be added to 120 liters of a 30% saline solution in order to produce a 20% saline solution?
A. 23 liters B. 54 liters C. 40 liters D. 60 liters E. NOT

16. Given the equation of a line $3x+5y=7$, what is the slope of any line perpendicular to this line?
A. $\frac{3}{5}$ B. $\frac{5}{3}$ C. $-\frac{3}{5}$ D. $-\frac{5}{3}$ E. NOT

17. Given: $\Delta SUN \cong \Delta TAN$, you cannot conclude that:
A. $\angle S \cong \angle T$ B. $\overline{SN} \cong \overline{TN}$ C. $\angle N \cong \angle A$ D. $\overline{SU} \cong \overline{TA}$ E. NOT

18. Simplify: $\dfrac{\frac{1}{5}+\frac{1}{6}}{\frac{1}{5}-\frac{1}{6}}$.
A. $\frac{11}{5}$ B. $\frac{11}{6}$ C. $\frac{6}{11}$ D. 11 E. NOT

19. What two digit number is a perfect cube and has tens and units digits whose sum is 9?
A. 81 B. 36 C. 27 D. 64 E. NOT

20. $245_6 =$ _____$_7$
A. 23 B. 203 C. $14\frac{3}{7}$ D. 231 E. NOT

21. Find the sum of $\frac{1}{30}$ of an hour and $\frac{2}{15}$ of a minute.
A. 14 minutes B. 128 seconds C. 10 minutes D. 102 seconds E. NOT

22. $\angle 1$ and $\angle 2$ are same side interior angles formed by a transversal and two parallel lines. If $m\angle 1 = 5x+15$ and $m\angle 2 = 10x$, find $m\angle 1$.
A. 5 B. 11 C. 40 D. 70 E. NOT

23. Simplify: $4^2 - 4! - 4$
A. −12 B. −20 C. −28 D. −16 E. NOT

24. Two parallel lines are intersected by a transversal. What is the relationship between the consecutive interior angles?
A. congruent B. complementary C. adjacent D. vertical E. NOT

25. The ordinate is another name for: the
A. x-axis B. y-coordinate C. y-axis D. x-coordinate E. NOT

26. $36^2 - 23^2 =$ _____.
A. 747 B. 767 C. 676 D. 727 E. NOT

27. Find the product of 153 and 202.
A. 33,906 B. 306,306 C. 33,936 D. 30,906 E. NOT

28. $\frac{3}{8}+1.5+0.02\% =$ _____.

A. 3.875 B. 1.877 C. 1.895 D. 1.8752 E. NOT

29. Daffy was to be paid 100 feathers plus an egg if he worked for Elmer for one year. Daffy flew away after only seven months, but he was paid 20 feathers and an egg for his work. How much was the egg worth?

A. $58\frac{1}{3}$ feathers B. $15\frac{35}{36}$ feathers C. $38\frac{1}{3}$ feathers D. 92 feathers E. NOT

30. Find the units digit of 7^{10}.

A 7 B. 9 C. 1 D. 3 E. NOT

31. $14\frac{1}{3}$ yards + $2\frac{1}{2}$ feet = _____ inches.

A. 202 B. 606 C. 576 D. 546 E. NOT

32. What is the multiplicative inverse of $-2\frac{1}{4}$?

A. $\frac{4}{9}$ B. $2\frac{1}{4}$ C. $\frac{9}{4}$ D. $-\frac{4}{9}$ E. NOT

33. 85% of 51 = _____ of 867.

A. 3% B. 5% C. 17% D. 15% E. NOT

34. $114_5+123_5 =$ _____$_5$

A. 242 B. 212 C. 237 D.232 E. NOT

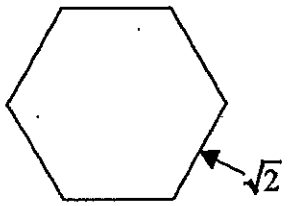
35. $\frac{67^2-33^2}{51^2-49^2} =$ _____

A. 170 B. 17 C. 71 D. 107 E. NOT

36. Find the area of the regular polygon.

A. $\frac{\sqrt{6}}{4}$ B. $3\sqrt{3}$

C. $\frac{2\sqrt{3}}{3}$ D. $4\sqrt{3}$ E. NOT



37. Write $\frac{13}{40}$ as a percent.

A. 26% B. 3.25% C. 32.5% D. 39% E. NOT

38. $125^2 =$ _____.

A. 15,225 B. 16,225 C. 1,565 D. 15,625 E. NOT

39. If the sides of a cube are halved, then its volume is multiplied by:

A. 2 B. 4 C. $\frac{1}{8}$ D. $\frac{1}{2}$ E. NOT

40. $\sqrt{\frac{7}{11}} \div \sqrt{\frac{11}{7}} =$ _____.

A. $\frac{\sqrt{11}}{7}$ B. 1 C. $\frac{7}{11}$ D. $\frac{11}{7}$ E. NOT

41. What is the ninth triangular number?

A. 45 B. 54 C. 56 D. 36 E. NOT

42. $3367 \times 45 =$ _____.

A. 15,151 B. 151,515 C. 10,505 D. 155,515 E. NOT

43. The surface area of a cube is 392 cm^2. Find the inner diagonal.

A. 16 B. 12.5 C. 14 D. 18 E. NOT

44. On the first of three tests, Megan scored a 88. On the third test, her score was three-fourths of the first test. Her average on the three tests was 83. What were her scores on the second and third tests, respectively?

A. 95 and 65 B. 66 and 95 C. 65 and 95 D. 95 and 66 E. NOT

45. Find the supplement of a 74° angle.

A. 106° B. 16° C. 84° D. 6° E. NOT

46. If an equilateral triangle and a square have sides of the same length, what is the ratio of the area of the triangle to the square?

A. $\frac{3}{4}$ B. $\frac{4}{3}$ C. $\frac{\sqrt{3}}{4}$ D. $\frac{3\sqrt{3}}{4}$ E. NOT

47. Which one of these equations is linear?

A. $y = \frac{1}{3}x - 3$ B. $x + 3y^2 = 4$ C. $xy = 6$ D. $y - 6 = 2x(x - 4)$ E. NOT

48. Another name for a tetrahedron is a(n);

A. hexagonal pyramid B. cube C. triangular pyramid
D. pentagonal pyramid E. NOT

49. Find the quotient of 18.81 and 1.07.

A. 20.1267 B. 21.1067 C. 21.1267 D. 21.2627 E. NOT

50. Find the number halfway between and 0.29 and $\frac{1}{8}$.

A. 0.2175 B. $\frac{83}{400}$ C. $\frac{1}{4}$ D. 0.3175 E. NOT

2005-2006 TMSCA Middle School Mathematics Test #5 Key

1.	C	21.	B	41.	A
2.	D	22.	D	42.	B
3.	E (congruent)	23.	A	43.	C
4.	D	24.	E (supplementary)	44.	D
5.	A	25.	B	45.	A
6.	A	26.	B	46.	C
7.	C	27.	D	47.	A
8.	B	28.	D	48.	C
9.	A	29.	D	49.	A
10.	B	30.	B	50.	B
11.	E (none are true)	31.	D		
12.	C	32.	D		
13.	D	33.	B		
14.	B	34.	A		
15.	D	35.	B		
16.	B	36.	B		
17.	C	37.	C		
18.	D	38.	D		
19.	C	39.	C		
20.	B	40.	C		

2005-2006 TMSCA Middle School Mathematics Test #5 Selected Solutions

10. Let $x = \textit{number of people who own both}$. So number who own dogs $= 67 - x$ and number who own cats $= 71 - x$.

$(71 - x) + (67 - x) + x = 100 - 20$

$-x + 138 = 80$

$-x = -58$

$x = 58$

15. $0.3(120) = 0.2(x + 120)$

$36 = 0.2x + 24$

$12 = 0.2x$

$60 = x$

29. $\frac{7}{12}(100 + x) = 20 + x$

$\frac{700}{12} + \frac{7}{12}x = 20 + x$

$\frac{700}{12} - 20 = x - \frac{7}{12}x$

$58\frac{1}{3} - 20 = \frac{5}{12}x$

$\frac{115}{3} \times \frac{12}{5} = x$

$92 = x$

36. **Area of equilateral triangle** $= \frac{s^2\sqrt{3}}{4} \times 6$ *triangles*

$\frac{\sqrt{2}^2\sqrt{3}}{4} \times 6 = \frac{2\sqrt{3}}{4} \times \frac{6}{1} = \frac{12\sqrt{3}}{4} = 3\sqrt{3}$

43. $SA = diagonal^2 \times 2$

$392 = d^2 \times 2$

$196 = d^2$

$14 = d$

46. $\frac{\textit{triangle area}}{\textit{square area}} = \frac{\frac{s^2\sqrt{3}}{4}}{s^2} = \frac{s^2\sqrt{3}}{4} \div s^2 = \frac{s^2\sqrt{3}}{4} \times \frac{1}{s^2} = \frac{s^2\sqrt{3}}{4s^2} = \frac{\sqrt{3}}{4}$