

Franklin Math Bowl
8th Grade Math Contest 2006

1. Which of these is *not* equal to the others?
(A) $4\frac{3}{5}$ (B) 4.6 (C) $\frac{43}{5}$ (D) $\frac{46}{10}$

2. $-\frac{7}{12} - \frac{-3}{4} =$ (A) $-\frac{1}{6}$ (B) $\frac{1}{6}$ (C) $\frac{4}{3}$ (D) $-\frac{4}{8}$

3. If $4a + 4a + 4a = 48$, then what is the value of $7a - 2$?
(A) 20 (B) 82 (C) 26 (D) 30

4. What number is next in the sequence? 81, 27, 9, 3, 1, . . .
(A) $\frac{1}{3}$ (B) $\frac{1}{9}$ (C) 0 (D) -3

5. You multiplied 85,300,000,000,000,000 by 87,000,000,000. How many zeroes does the product end with?
(A) 24 (B) 23 (C) 22 (D) 21

6. A fair coin is tossed three times. What is the probability that it lands tails up all three times?
(A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{3}{8}$ (D) $\frac{1}{8}$

7. A car rental agency charges \$57 a day to rent a standard size car with unlimited mileage. Another option is to pay \$29 a day plus \$.35 per mile. How many miles could you drive in one day and pay the same price for either plan? (Round to the nearest whole mile.)
(A) 80 (B) 64 (C) 246 (D) 106

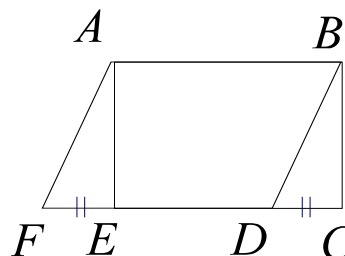
8. $\frac{8 \times 10^7}{2 \times 10^{13}} = ?$ (A) 4×10^6 (B) 4×10^{-6} (C) 16×10^{20} (D) 16×10^{-6}

9. A car travels at an average speed of 45 mph. How far will it travel in 2 $\frac{1}{2}$ hours?
(A) 180 miles (B) 90 miles (C) 135 miles (D) 112.5 miles

10. The Roman numeral $\overline{\text{CMVII}}\text{DCCCXCIV}$ stands for
(A) 117,994 (B) 907,896 (C) 1,107,894 (D) 907,894

11. Suppose p stands for "Today is Monday" and q stands for "It is raining." In which of the following circumstances would the statement " p and q " be true?
- (A) a rainy Monday (C) a snowy Monday
(B) a sunny Tuesday (D) a rainy Tuesday

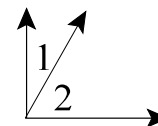
12. How does the area of rectangle $ABCE$ compare with the area of parallelogram $ABDF$?
- (A) The rectangle has a greater area.
(B) The parallelogram has a greater area.
(C) There isn't enough information to tell.
(D) They have the same area.



13. The prime factorization of 14,850 is
- (A) $2 \times 3^3 \times 5^2 \times 11$ (B) $2^3 \times 3^2 \times 5^2 \times 7$ (C) $2^2 \times 3^6 \times 5$ (D) $2 \times 3^6 \times 11$

14. Angles 1 and 2 in the figure are complementary. Angle 1 measures 40° . What is the measure of the angle formed by the bisectors of the two angles?

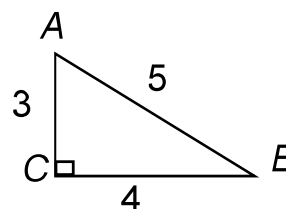
- (A) 55° (B) 50° (C) 40° (D) 45°



15. A 21-foot ladder is leaned up against a wall with its bottom 5 feet away from the wall. To the nearest foot, how high off the ground is the top of the ladder?
- (A) 20 feet (B) 16 feet (C) 17 feet (D) 19 feet

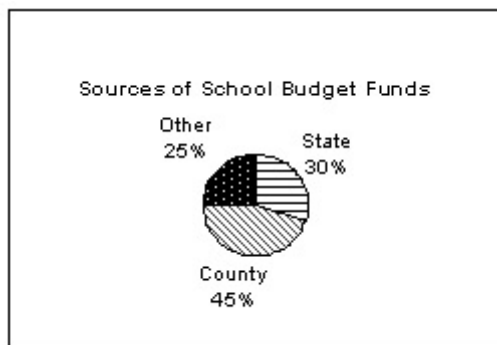
16. The *tangent* of an acute angle in a right triangle is defined as the length of the leg opposite the angle divided by the length of the leg (not the hypotenuse) adjacent to the angle. What is the tangent of angle B in the figure?

- (A) $\frac{3}{4}$ (B) $\frac{3}{5}$ (C) $\frac{4}{5}$ (D) $\frac{4}{3}$



17. The Boorstin family's house was worth \$125,000 last year. Due to some improvements they made, their house increased in value by 15% this year. If they pay a property tax of 1.3% based on this year's valuation of the house, how much is this year's property tax?

- (A) \$243.75 (B) \$1868.75 (C) \$1625.00 (D) \$1381.25



18. The pie graph at left shows the funding sources for a school system. If you were going to make the graph using a protractor instead of using a computer, what (central) angle would you use to make the slice for state funding?

(A) 30° (C) 120°
 (B) 54° (D) 108°

19. In the same school system, the county provided \$58 million in funding. What was the total budget for the year to the nearest hundred thousand?

(A) \$26,100,000 (C) \$128,900,000
 (B) \$17,400,000 (D) \$14,500,000

20. A cylindrical can of radius 4 cm and height 15 cm is placed in a box that is 8 cm by 8 cm by 15 cm (on the inside). The rest of the box is filled with packing. What is the volume of the packing? Use 3.14159 for π and round to the nearest hundredth.

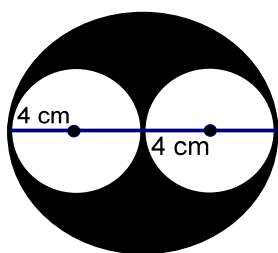
(A) 771.50 cm^3 (B) 206.02 cm^3 (C) 753.98 cm^3 (D) 583.009 cm^3

21. The following cards are made up, cut out, and placed in a hat.

F	R	A	N	K	L	I	N	M	A	T	H	B	O	W	L
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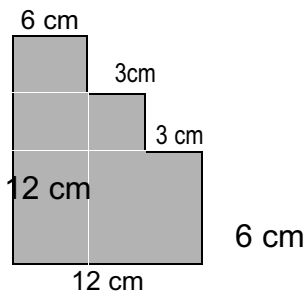
Three cards are drawn from the hat. The cards are not replaced after being drawn. What is the probability that the first card is a vowel, the second card is an N, and the third card is one of the last nine letters of the alphabet?

(A) $\frac{1}{140}$ (B) $\frac{3}{512}$ (C) $\frac{251}{420}$ (D) $\frac{9}{16}$



22. The radius of each of the smaller circles in the diagram at left is 4 cm. They touch at the center of the large circle, and the diameter of each smaller circle is a radius of the larger circle. Find the area of the shaded area. Use 3.14159 for π and round to the nearest hundredth.

(A) 25.13 cm^2 (C) 100.53 cm^2
 (B) 37.70 cm^2 (D) 150.80 cm^2



23. What is the area of this figure?
(A) 117 cm^2 (B) 144 cm^2 (C) 48 cm^2 (D) 135 cm^2

24. In how many ways can we pick a slate of candidates for president, vice president, and secretary from a club which has 7 members?
(A) 210 (B) 840 (C) 21 (D) 343

The last question may be used as a tie-breaker. Show your work on the answer sheet provided.

25. A triangle is drawn on a coordinate system. Its vertices are $(0,2)$, $(0,5)$, and $(8,2)$. A larger triangle is drawn by multiplying each x - and y -coordinate by 3. How does the area of the larger triangle compare to the area of the smaller triangle?
(A) It is 9 times larger. (C) It is 3 times larger.
(B) It is 2 times larger. (D) It is 27 times larger.

**Answers – Franklin Math Bowl
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1. C
2. B
3. C
4. A
5. B
6. D
7. A
8. B
9. D
10. D
11. A
12. D
13. A
14. D
15. A
16. A
17. B
18. D
19. C
20. B
21. A
22. C
23. A
24. A
25. A