

FRANKLIN MATH BOWL
7TH Grade Written Test 2004

1. Which of the following is the 3rd composite number?

- [A] 6 [B] 7 [C] 8 [D] 9

2. Find the diameter of a circle whose area is $8\pi \text{ in}^2$.

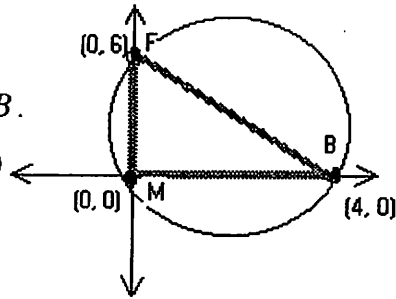
- [A] $4\sqrt{2} \text{ in}$ [B] 16 in [C] 8 in [D] $2\sqrt{2} \text{ in}$

3. Which of the following could *not* be side lengths of a scalene triangle?

- [A] 3cm, 7cm, 8cm [B] 2cm, 3cm, 6cm
[C] 3cm, 4cm, 5cm [D] 4 cm, 7cm, 9cm

4. Find the center of the circle that circumscribes $\triangle FMB$.

- [A] (1, 2) [B] (1, 3) [C] (2, 2) [D] (2, 3)



5. The sum of six integers is what percent of the average of six integers?

- [A] .001% [B] 2% [C] 10% [D] 600%

6. What is the average of $2b+4$, $b+5$, and $3b+9$?

- [A] $2b+18$ [B] $2b+6$ [C] $6b+18$ [D] $2b+3$

7. Solve for k. $a^k \cdot a^3 = \frac{1}{a^{2k}}$

- [A] 1 [B] -1 [C] 10 [D] -3

8. In a quadrilateral, two of the angles each have a measure of 110° , and the measure of a third angle is 90° . What is the measure of the remaining angle?

- [A] 50° [B] 90° [C] 120° [D] 140°

9. Find the slope between the two ordered pairs $\left(\frac{3}{7}, \frac{4}{5}\right)$ and $\left(\frac{4}{9}, \frac{5}{6}\right)$.

- [A] $\frac{21}{10}$ [B] $\frac{10}{21}$ [C] $-\frac{21}{10}$ [D] $-\frac{10}{21}$

10. A straight line on a graph passes through (a, b) and $(0, c)$. Which of these points also lies on the line?

- [A] $\left(\frac{a}{2}, \frac{b+c}{2}\right)$ [B] $\left(\frac{a}{2}, \frac{b}{2}\right)$ [C] $\left(\frac{a}{2}, \frac{3c-b}{2}\right)$ [D] $\left(\frac{a}{2}, \frac{-b}{2}\right)$

11. A quadrilateral MUST be a parallelogram if it has

- [A] one pair of adjacent sides equal. [B] two pairs of parallel sides
[C] a diagonal as axis of symmetry [D] two adjacent angles equal

12. An angle is 4 times its complement. Find the angle.

- [A] 90° [B] 72° [C] 22.5° [D] 18°

13. Paul picked a number. He multiplied the number by 5, added 3, multiplied that result by 7 and ended up with 91. What number did Paul pick?

- [A] 1 [B] 2 [C] 3 [D] 0

14. Solve for a, b, c, and d.
$$\begin{bmatrix} 3a+5 & 2b \\ 3(c-2) & d \end{bmatrix} = \begin{bmatrix} a-7 & -2b \\ 0 & 2(d-6) \end{bmatrix}$$

- [A] $a = -3$ [B] $a = 3$ [C] $a = 3$ [D] $a = -6$
 $b = 1$ $b = -1$ $b = -1$ $b = 0$
 $c = 2$ $c = \frac{2}{3}$ $c = \frac{2}{3}$ $c = 2$
 $d = -4$ $d = 0$ $d = 6$ $d = 12$

15. Simplify $\frac{2^3 m^{-2} (n^3)^2 p^4}{4^3 m^2 p^4 n^{-1}}$

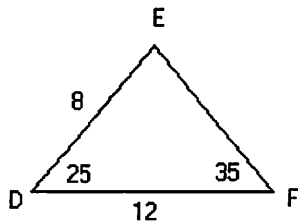
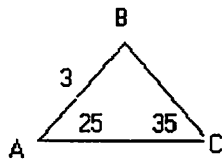
[A] $\frac{n^5}{2}$

[B] $\frac{3n^7}{32}$

[C] $\frac{n^6}{8m^4}$

[D] $\frac{n^7}{8m^4}$

16. Triangles $\triangle ABC$ and $\triangle DEF$ are similar triangles. What is the length of side AC?



[A] 2

[B] 4

[C] 4.5

[D] 5.5

17. Juan has 5 fewer hats than Maria, and Clarissa has 3 times as many hats as Juan. If Maria has n hats, which of these represents the # of hats that Clarissa has?

[A] $n-5$

[B] $3n$

[C] $3(n-5)$

[D] $3n-5$

18. A drawer contains 28 pens; some white, some blue, some red, and some green. If the probability of selecting a blue pen is $\frac{2}{7}$, how many blue pens are in the drawer?

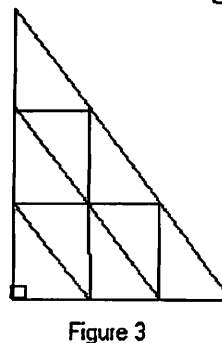
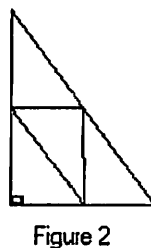
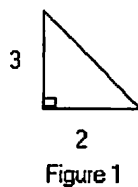
[A] 4

[B] 6

[C] 8

[D] 10

19. Here is a sequence of three similar triangles. All of the small triangles are congruent.



If the sequence of similar triangles is extended to the 8th figure, how many small triangles would be needed for figure 8?

[A] 16

[B] 32

[C] 64

[D] 72

20. Peter bought 60 items and Sue bought 90 items. Each item costs the same and the items cost \$1050 all together. How much did Sue pay?

- [A] \$7.00 [B] \$10.00 [C] \$420.00 [D] \$630.00

21. What is the measure of an interior angle of a regular decagon?

- [A] 140 degrees [B] 144 degrees [C] 90 degrees [D] 135 degrees

22. Which of these represents the longest amount of time?

- [A] 10 hours [B] 15,000 seconds [C] 1 day [D] 1500 minutes

23. Busses from Atlanta to Memphis leave every hour on the hour. Busses from Memphis to Atlanta leave every hour on the half hour. The trip from one city to the other takes 6 hours. Assuming the busses travel at the same speed on the same highway, how many Atlanta bound busses does a Memphis bound bus pass on the highway?

- [A] 6 [B] 10 [C] 8 [D] 12

24. Jerry receives an 8% raise each year. After four such raises, his salary has gone up by what percent?

- [A] less than 32% [B] 32% [C] 35% [D] more than 35%

25. Five test scores have a mean of 85, a median of 82, and a mode of 80. What is the sum of the two highest test scores?

- [A] 183 [B] 170 [C] 185 [D] 193