1. Which of the following is not equal to \( \frac{57}{7} \)?

A) \( \frac{1}{9} \)  
B) \( \frac{2}{9} \)  
C) \( \frac{3}{9} \)  
D) \( \frac{5}{9} \)  
E) \( \frac{4}{9} \)

2. What is the next term in the sequence: 2, 8, 18, 28, ...?

3. The first term in a geometric sequence is 3 and the 4th term is 91. What is the 10th term of the sequence?

A) 177,147  
B) 59,049  
C) 19,683  
D) 65,611  
E) 21,477

4. For which of the following values of \( x \) is \( x^2 < x \) not a true statement?

A) -3  
B) 0  
C) -\( \frac{1}{2} \)  
D) \( \sqrt{3} \)  
E) \( \frac{1}{2} \)

5. If \( 3x^2 = 81 \), then \( x = ? \)

6. What is the greatest integer that evenly divides both 48 and 64?

7. The sum of 3 consecutive integers is 15. How many distinct prime factors does the product of these three numbers have?

A) 2  
B) 3  
C) 4  
D) 5  
E) 6

8. In the repeating decimal 0.714285714285... what is the 50th digit to the right of the decimal point?

9. How many distinct composite numbers can be formed by adding 2 of the first 5 prime numbers?

10. 3 gallons of paint are needed to paint a wall that is 100 feet. How many gallons of paint must be purchased to paint 480 feet of wall space?

A) 14  
B) 18  
C) 16  
D) 17  
E) 18

11. Store A, store B, and store C sell soccer balls. The ratio of the number of balls sold at A to B is 7:4. The ratio of the number of soccer balls sold at B to C is 5:3. If store C sold 36 soccer balls, how many soccer balls did store A sell?
(12) A camping tent went on sale from $60 to $40. A camping chair that originally cost $20 was discounted by the same percent. What is the new price of the camping chair?

A) 25
B) 20
C) 15
D) 10
E) 5

(13) 16% of s equals 9. 10% of t equals 4. What is the value of s - t?

(14) The average of x and y is 7, and x = 3x + 2. What is the average of y and z?

A) 2x + 6
B) 2x + 16
C) 2x + 10
D) x - 6
E) x + 8

(15) a, b, c, and d are all positive integers such that abcd = 150, and none of these values are equal to each other. What is the smallest possible value for the median of a, b, c, and d?

A) 5
B) 4
C) 3
D) 2
E) 1

(16) \( \frac{3}{5x} = \frac{2}{y} \), \( \frac{c}{d} = \)

(17) \( \frac{a^2 - b^2}{c^2 - d^2} = \)

(18) \( m \# n = m^2 - n^2 \), \( \frac{m \# n}{m - n} = \)

A) m
B) m - n
C) mn
D) mn
E) m/n

(19) \( \Delta = ax^2 + bx + c \)

A) -6
B) -10
C) -15
D) -16
E) -21

(20) \( A = (-3, 5) \) and \( B = (3, -4) \). The absolute value of the slope of \( \overline{AB} \) is equal to the slope \( \overline{AC} \). What are the coordinates of point \( C \)?

A) \( (2, -1) \)
B) \( (1, 8) \)
C) \( (2, 3) \)
D) \( (2, -3) \)
E) \( (-2, 3) \)
21. Carolyn works at an accounting firm. Her starting salary is $10,000 per week. She receives a 7% raise each year. At this raise increase, what will her salary be rounded to the nearest dollar after 10 years? (per week)

22. \( f(5) = 15 \) and \( g(x) = f(x+3) - 5 \). 
\( g(3) = \)

23. What is the area of the triangle below?

24. What is the length of the perimeter of an equilateral triangle with a height of 6 ft?
A) 2\(\sqrt{3}\) ft
B) 4\(\sqrt{3}\) ft
C) 6\(\sqrt{3}\) ft
D) 10\(\sqrt{3}\) ft
E) 12\(\sqrt{3}\) ft

25. Two sides of a triangle are 7 and 16, which of the following is not the length of the third side?
A) 22
B) 17
C) 12
D) 10
E) 9

26. \( a + b + c + x + y = \)

27. \( \triangle ABC \) is an equilateral triangle and \( \triangle ABD \) is an isosceles triangle. If \( AB = 2 \) what is the area of the shaded region?

A) 108\(\sqrt{3}\)
B) 72\(\sqrt{3}\)
C) 36\(\sqrt{3}\)
D) 144
E) 72

28. The angles of a pentagon are in ratio 9:10:12:14:15. What is the sum of measures of the smallest and largest angles?
A) 54
B) 91
C) 135
D) 216
E) 270
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24. The area of the circle O below is \(36\pi\). What is the length of \(BA\)?

\[\text{(not drawn to scale)}\]

A) 4.5  
B) 5  
C) 5.5  
D) 6  
E) 6.5

25. A sphere is created within half the radius of the original sphere. What is the ratio of the volume of the original to the volume of the new sphere?

\[\text{Volume of original} : \text{Volume of new}\]

A) 1:8  
B) 8:1  
C) 2:1  
D) 1:2  
E) 4:1

26. The diameter of the large circle is 12. The center of each of the three congruent smaller circles lies on the diameter of the larger one. What is the area of the shaded region?

\[\text{(not drawn to scale)}\]

A) \(2052\) ft\(^2\)  
B) \(1368\) ft\(^2\)  
C) \(1080\) ft\(^2\)  
D) \(684\) ft\(^2\)  
E) \(342\) ft\(^2\)

27. The volume of a rectangular prism is 1080 cm\(^3\). The ratio of width:height is 2:1:4. What is the surface area of the prism?

\[\text{Volume of original} = 1080\text{ cm}^3\]

A) \(2052\) ft\(^2\)  
B) \(1368\) ft\(^2\)  
C) \(1080\) ft\(^2\)  
D) \(684\) ft\(^2\)  
E) \(342\) ft\(^2\)

28. There are 15 students on the prom committee and 20 students on the yearbook committee. If 10 students are on both, how many students are on only one committee?

A) 5  
B) 10  
C) 15  
D) 20  
E) 25

29. There are 10 orange sodas, 15 cream sodas, and 7 cherry sodas in an ice chest. How many sodas must be removed from the ice chest to guarantee that one of each type of soda has been chosen?

A) 16  
B) 18  
C) 23  
D) 25  
E) 26
36. A dart is thrown randomly at the target below. The radius of the innermost circle is 2 cm, and the radius of each circle doubles as the circles get bigger. What is the probability the dart will hit the shaded region to the nearest hundredth of a percentage?

(not drawn) (so scale)

37. A certain communication system is made up of 40 symbols. A maximum of two symbols placed together, order not mattering, make up a word. What is the maximum number of words in this communication system?

38. Julie worked 3 less than twice as many hours as Bruce. Which of the following choices represents the number of hours that Julie worked based on the number of hours that Bruce, B worked?

A) J = 2B - 3
B) J = 2 - 3B
C) J = 2B + 3
D) J = 3 - 2B
E) J = -2B - 3

39. Bob invested in a stock that increased in value by 17% up to $25.74. What was the actual increase?

40. A theater charges $5 for children and $7 for adults to attend a children's play. A total of 1600 tickets were sold for a total of $9200. How many children's tickets were sold?

A) 600    B) 700    C) 800    D) 900    E) 1000