

Important Circle Formulas

$$\text{Circumference: } C = \pi d$$

$$\text{Area: } A = \pi r^2$$

1. Point P is the point of intersection of the horizontal line through $(4, 2)$ and the vertical line through $(-5, 5)$. What is the sum of the coordinates of point P ?
1. _____

2. Find n such that $2! \cdot 3! \cdot 4! \cdot n = 8!$
2. _____

3. What is the sum of all of the distinct, positive prime factors of 1260?
3. _____

4. The perimeter of a triangle is 100 cm. Two side of a triangle are equal in length; the third side is 20 cm greater than each of the other two. Find the length of each side.
4. _____

5. Calculate $\frac{1}{4} \cdot \frac{2}{5} \cdot \frac{3}{6} \cdot \frac{4}{7} \cdot \dots \cdot \frac{49}{52} \cdot \frac{50}{53}$.
Express your answer as a common fraction.
5. _____

6. A flagpole is placed in the sand with the top of the flagpole standing 10 feet above the ground. A 26-foot string is attached to the top of the flagpole at point A. Holding the string to the ground, what is the number of square feet in the area of the largest circle that can be drawn in the sand with the end of the string? Express your answer in terms of π .



6. _____ square feet

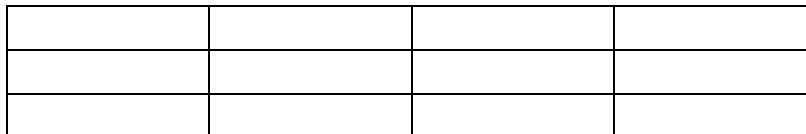
7. City Cab Company charges \$1.60 plus \$0.25 per $\frac{1}{8}$ mile. The distance from the airport to the Ritz hotel is 13.25 miles. Two passengers will share the fare equally. How many dollars will each passenger owe? Express your answer to the nearest hundredth.

7. _____

8. How many three-digit numbers contain the digit 3 at least once?

8. _____

9. How many rectangles are in the figure below?



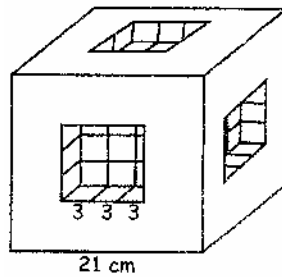
9. _____

10. Find two positive integers such that the difference of their squares is 25.

10. _____

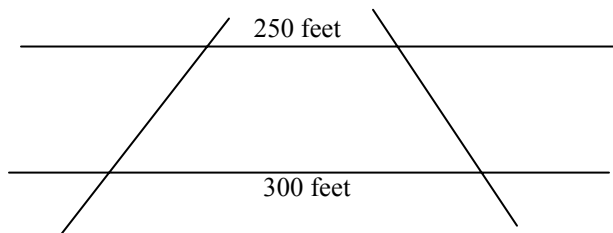
11. A solid cube measures 21 cm on an edge. Nine cubes of edge 3 cm are removed from the center of each face of the original cube. What is the number of square centimeters in the surface area of the new object?

11. _____ cm²



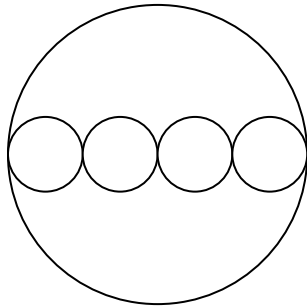
12. Two parallel sides of a playground are 264 feet apart and are crossed by two other nonparallel sides. The playground is 300 feet long on one side and 250 feet long on the other. If sod costs 32¢ per square foot, what is the minimum amount of sod to be bought?

12. _____ square feet



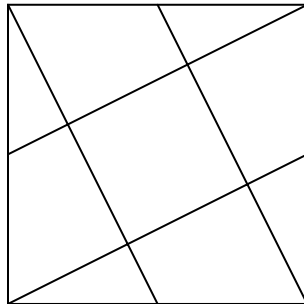
13. The school board has commissioned a local artist to create the five-circle wire sculpture shown in the figure. The centers of the five circles are all collinear. The diameter of the larger circle is 12 feet, and the diameters of each of the four smaller circles are equal. Wire is sold by the foot. What is the minimum number of feet of wire required to make the sculpture? Express your answer in terms of π .

13. _____ feet



14. The vertices of a square are connected to the midpoint of another side, as shown in the figure, in the process forming a smaller square. The area of the smaller square is what fractional part of the area of the given square?

14. _____



15. A math teacher, very much involved with numbers, was asked by his students how old he was. He agreed to tell them, but not without throwing in a challenge. Here is what he said:

15. _____

“My son is 24 years younger than I am. He, in turn is 25 years older than my grandson. My grandson and I together are 73 years old.”

How old is the math teacher?

16. How many three-digit numbers will fit the formula $a + b = c$, where the sum of the first two digits equals the last digit, for example: $1 + 4 = 5$. 16. _____

17. Five friends met every week for a card game. They used a table with six chairs. Eventually, they realized that they had chosen a different seating arrangement each week and had exhausted every possibility. 17. _____

How long had the friends played cards together?

18. What is the least positive integer meeting each of the following conditions?
Dividing by 6 gives a remainder of 0.
Dividing by 8 gives a remainder of 4.
Dividing by 5 gives a remainder of 1. 18. _____

19. The new playing field behind the school is in the shape of a rectangle that is 80 yards long and 50 yards wide. On each of the shorter sides, there is a semi-circle whose diameter is the shorter side. How much will it cost to sod the new field if sod costs \$1 per square yard? Use 3.14 for π . Round answer to nearest cent. 19. _____

20. What numbers have to be substituted for the symbols in order to work out the equations below? Each symbol represents a different number. Look for positive whole numbers.

$$\begin{array}{rcccc}
 \circ & + & \Delta & = & * \\
 + & & + & & + \\
 \Delta & + & \square & = & \circ \\
 \hline
 * & + & \circ & = & 13
 \end{array}$$

20. $\circ =$ _____

$\Delta =$ _____

$*$ = _____

$\square =$ _____