



Warm-Up 16

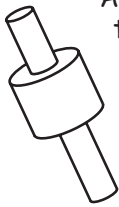


1. _____ comm A committee is to be formed consisting of three teachers and two students. If there are 6 teacher candidates and 4 student candidates, how many committees are possible?

2. _____ What is $-8\left(-\frac{2}{3}\right)$ expressed as a common fraction?

3. _____ The sum of the digits of a certain three-digit positive integer is 15. If the ones digit is removed from the three-digit integer, leaving the digits in the hundreds place and tens place together as a two-digit integer, that integer is twice the original units digit. If the tens digit is removed from the three-digit integer, leaving the digits from the hundreds and the units places together as a two-digit integer, that integer is three times the original tens digit. What is the three-digit integer?

4. _____ A solid right cylinder has a hole drilled through its axis of symmetry so that the radius of the hole is one-third of the radius of the original cylinder. A cylindrical rod has a radius equal to that of the hole, and the volume of the rod is the same as the volume of the cylinder with the hole in it. What is the ratio of the height of the cylinder with the hole to the height of the rod? Express your answer as a common fraction.



5. _____ triangles There are six plastic sticks of lengths 10, 20, 30, 40, 50 and 60 centimeters, respectively. What is the maximum number of non-congruent triangles that can be formed using different combinations of these sticks as sides?

6. _____ The graph of $7x + 3y = K$, with K a positive integer, passes through exactly two lattice points in the first quadrant, ($x > 0$, $y > 0$). What is the smallest possible value of K ?

7. _____ If $a + b + c = 17$ and $ab + ac + bc = 86$, what is the value of $a^2 + b^2 + c^2$?

8. _____ Using only letters from the set $\{B, C, D, F, G, H, J\}$, all of the possible four-letter "words" are written in alphabetical order starting with BBBB. What is the 2010th word in the list?

9. _____ In the table of numbers shown, each row contains one more number than the row above it. Each number in the table is the sum of twice the number to its upper-left and three times the number to its upper-right. A blank is considered to have a value of 0. Thus, the 12 in the third row is computed from $2(3) + 3(2)$, and the 4 in the third row is computed from $2(2) + 3(0)$. What is the sum of the numbers in the 6th row of the table?

1
3 2
9 12 4
⋮

10. _____ % The radius of a right cylinder is increased by 50% and its height is decreased by $66\frac{2}{3}\%$. By what percent is the volume of the cylinder decreased?