

Warm-Up 14

1. _____ The symbol $*$ represents a sequence of mathematical operations. If $12 * 6 = 35$, $4 * 2 = 3$, $11 * 14 = 8$, $5 * 7 = 3$ and $10 * 7 = 8$, what is the value of $8 * 4$?

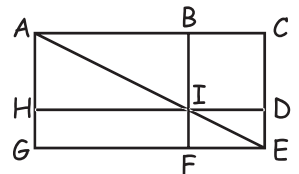
2. _____ What is the value of x in the equation $3^{12} + 3^{12} + 3^{12} = 3^x$?

3. _____ If the graph of $f(x) = 2x^2 + bx - 3$ is symmetric about the line $x = 3$, what is the value of b ?

4. _____ pieces Brenda gave Gail as many pieces of candy as Gail already had. Then Gail gave Brenda as many pieces of candy as Brenda needed to double her amount of candy. Now Brenda has three times as many pieces of candy as Gail. If Gail has at least one piece of candy, what is the minimum total number of pieces of candy needed for this to have occurred?

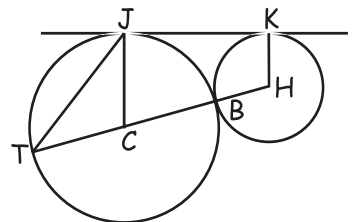
5. _____ points Point A is located at (5, 5) on the Cartesian plane. Point B is also in the plane and has integer coordinates. If $0 < AB \leq 4$, at how many points could B be located?

6. _____ sq units A diagonal is drawn in rectangle ACEG, as shown. Segments BF and HD are drawn parallel to sides CE and GE, respectively, with segments AE, BF and HD intersecting at point I. The area of rectangle BCDI is 36 square units. What is the area of rectangle FGHI?



7. _____ sq units What is the area of a triangle with vertices at (-5, -1), (3, 5) and (1, 9) on the coordinate plane?

8. _____ degrees In the figure, the circles with centers C and H are tangent to line JK at points J and K, respectively, and are externally tangent at point B. Points T, C, B and H are collinear. The measure of angle KHB is 110° . What is the measure of angle CJT?



9. _____ sets Two positive integers are relatively prime if 1 is their only common factor. How many sets of two relatively prime integers are there for which both integers in the set are greater than or equal to 2 and less than or equal to 9?

10. _____ In a study of the effects of time pressure on Mathletes, one-third of the Mathletes were given buzzers and the rest were not. All of the Mathletes answered a particular question. One-third of those with buzzers answered the question correctly, while one-fourth of those answering the question correctly had buzzers. What fraction of the students without buzzers answered the question correctly? Express your answer as a common fraction.