



Try these problems before watching the lesson.

1. Parallelogram $ABCD$ has $A(0, 1)$, $B(2, 1)$ and $C(4, 0)$ as three of its vertices. What is the sum of the coordinates of point D ?
2. What is the area, in square units, of a triangle whose vertices are at $(4, -1)$, $(10, 3)$ and $(4, 5)$?
3. If k is a line through $(2, -5)$ and $(-1, 8)$, then what is the slope of a line that is perpendicular to k ?
4. Points $A(0, 0)$, $B(6, 0)$, $C(6, 10)$ and $D(0, 10)$ are vertices of rectangle $ABCD$, and E is on segment CD at $(2, 10)$. What is the ratio of the area of triangle ADE to the area of quadrilateral $ABCE$? Express your answer as a common fraction.



First Problem: If x and y are integers such that $(x - 3)^2 + (y + 4)^2 = 25$, what is the greatest possible value of $x^2 + y^2$?

Second Problem: A triangle in the coordinate plane has vertices at $(-4, 0)$, $(6, 0)$ and $(0, 5)$. The line $y = \frac{5}{4}x + c$, where c is a positive number, divides the triangle into a trapezoid and a smaller triangle whose areas, respectively, are in the ratio $5 : 4$. What is the value of c ?

 Follow-up Problems

5. Triangle ABC has vertices $A(0, 0)$, $B(0, 3)$ and $C(5, 0)$. A point P inside the triangle is $\sqrt{10}$ units from point A and $\sqrt{13}$ units from point B . How many units is P from point C ? Express your answer in simplest radical form.
6. This circle passes through the points $(-1, 2)$, $(3, 0)$ and $(9, 0)$. The center of the circle is at (h, k) . What is the value of $h + k$?
7. Find the point (x, y) on the graph of $x + y = 3$ that is equidistant from $(3, -1)$ and $(7, -9)$.
8. Find the largest value of y/x for pairs of real numbers that satisfy $(x-3)^2 + (y-3)^2 = 6$. (Source: AHSME)

 Share Your Thoughts

Have some thoughts about the video? Want to discuss the problems on the Activity Sheet? Visit the MATHCOUNTS Facebook page or the Art of Problem Solving Online Community (www.artofproblemsolving.com).