

Practice Coordinate Geometry with Quadrilaterals

On a piece of graph paper, do the following problems and show work. Be prepared to share your work with the class. Keep your work neat and organized on the page.

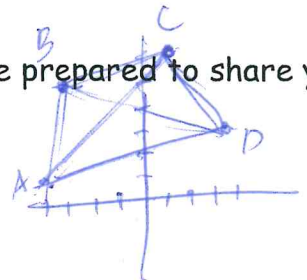
Quadrilateral ABCD has vertices A(-4,1), B(-3,5), C(1,6), and D(4,3).

- 1) Graph ABCD in a labeled coordinate plane.
- 2) Write an equation for AD in point slope form.
- 3) Write an equation for the line parallel to AD through (1,6).
- 4) Find the length of both diagonals of ABCD.
- 5) Find the midpoint of both diagonals.
- 6) Find the slopes of both diagonals.
- 7) Write an equation for the line perpendicular to $y = \frac{1}{4}x + 2$ passing through (0,2).

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- 1) Graph ABCD in a labeled coordinate plane.
- 2) Write an equation for AD in point slope form. $\frac{6-5}{4-3} = \frac{1}{4}$ $\frac{3-1}{4-4}$ $y-3 = \frac{1}{4}(x-4)$ or $y-1 = \frac{1}{4}(x+4)$
- 3) Write an equation for the line parallel to AD through (1,6). $y-6 = \frac{1}{4}(x-1)$
- 4) Find the length of both diagonals of ABCD. $AC = \sqrt{(1+4)^2 + (6-1)^2} = \sqrt{5^2 + 5^2} = \sqrt{50}$ $BD = \sqrt{(4+3)^2 + (5-3)^2} = \sqrt{7^2 + 2^2} = \sqrt{53}$
- 5) Find the midpoint of both diagonals. $AC = \frac{-4+1}{2}, \frac{1+6}{2} = (-\frac{3}{2}, \frac{7}{2})$ $BD = \frac{-3+4}{2}, \frac{5+3}{2} = (\frac{1}{2}, 4)$
- 6) Find the slopes of both diagonals. $\frac{6-1}{1+4} = \frac{5}{5} = 1$ $\frac{3-5}{4+3} = \frac{-2}{7}$
- 7) Write an equation for the line perpendicular to $y = \frac{1}{4}x + 2$ passing through (0,2). $y-2 = -4(x-0)$