Brainstorm your answers to the following.

1. Given the coordinates of 3 points, how would you determine:

   a. what type of triangle you have? (equilateral, isosceles, or scalene)
   b. if it is a right triangle?

2. Given the coordinates of 4 points, what is sufficient information to determine if the object is a:

   a. parallelogram?
   b. rectangle?
   c. rhombus?
   d. square?

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

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Classifying Geometric Figures

March 3/2016

We are going to analyze some geometric theorems.
To do this, we will use the following tools:

- slopes of parallel & perpendicular lines
- distance formula
- midpoint formula

NOTE:

When solving a problem involving a geometric figure, it is a good idea to start by drawing a diagram on a coordinate grid.

Grid - large

Ex.1. A triangle has vertices at P(-2, 2), Q(-1, -3), and R(4, 1).

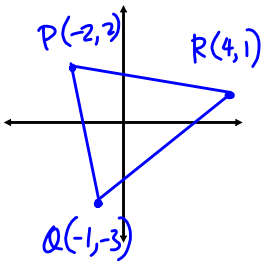
a) Show that this is NOT a right triangle.

$m_{PQ} = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{-3-2}{-1-(-2)}$

$= \frac{-5}{1}$

$= -5$



$m_{QR} = \frac{1-(-3)}{4-(-1)}$

$= \frac{4}{5}$

$m_{PR} = \frac{1-2}{4-(-2)}$

$= \frac{-1}{6}$

∴ no neg. reciprocals in slope,

∴ it is NOT a right triangle.

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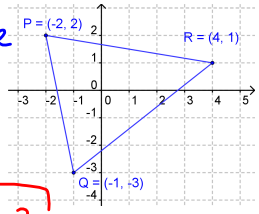
Ex.1. A triangle has vertices at P(-2, 2), Q(-1, -3), and R(4, 1).

b) Show that the triangle is scalene.

compare length of each side

d_{PQ} vs d_{QR} vs d_{PR}



$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$d_{PQ} = \sqrt{(-1-(-2))^2 + (-3-2)^2}$

$= \sqrt{1^2 + (-5)^2}$

$= \sqrt{1+25}$

$= \sqrt{26}$

$d_{QR} = \sqrt{41}$

$d_{PR} = \sqrt{37}$

∴ it is a scalene triangle.

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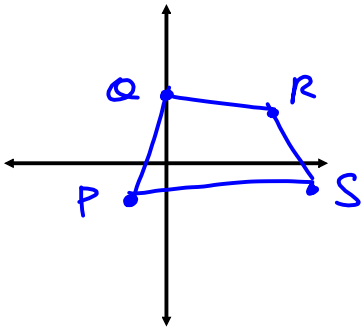
Ex.2. Determine the type of quadrilateral described by the points P(-2, -2), Q(0, 4), R(6, 3), and S(8, -1).

$$m_{PQ} = \frac{4-(-2)}{0-(-2)}$$

$$= \frac{6}{2}$$

$$= 3$$



$m_{QR} = \frac{1}{-6}$ $m_{RS} = -2$ $m_{PS} = \frac{1}{10}$

$$= \frac{-1}{6}$$

$\therefore$ it is an irregular quadrilateral

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Assigned Work:

p.101-103 # 2, 5, 6b, 7, 8, 11, 12, 16d

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