Brainstorm your answers to the following.

A) Given the coordinates of 3 points, how would you determine:
1. What type of triangle you have (equilateral, isosceles, scalene)
2. If it is a right triangle.

B) Given the coordinates of 4 points, what is sufficient information to determine if the object is a:
1. Parallelogram
2. Rectangle
3. Rhombus
4. Square

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Classifying Geometric Figures

March 2/2011

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

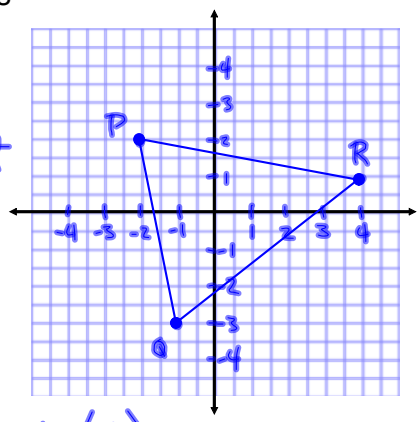
NOTE:
When solving a problem involving a geometric figure, it is a good idea to start by drawing a diagram on a coordinate grid.

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.

b) Show that the triangle is scalene.



(a) to look for right angles, need slopes of each line segment

$m_{PQ} = \frac{y_Q - y_P}{x_Q - x_P} = \frac{-3-(2)}{-1-(-2)} = \frac{-5}{1}$

$m_{PQ} = -5$

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

$m_{QR} = \frac{4}{5}$

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

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

∵ no neg. reciprocals in slopes

∴ triangle is not a right triangle.

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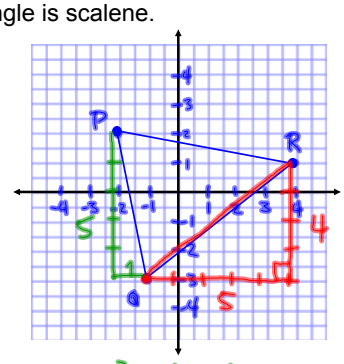
Ex.1. A triangle has vertices at P(-2, 2), Q(-1, -3), and R(4, 1).

a) Show that this is NOT a right triangle.

b) Show that the triangle is scalene.

(b) Scalene means all sides have a different length.

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



$d_{QR} = \sqrt{5^2 + 4^2}$

$= \sqrt{25 + 16}$

$= \sqrt{41}$ → exact value

$c^2 = a^2 + b^2$

$c = \sqrt{a^2 + b^2}$

$d_{PR} = \sqrt{(4-(-2))^2 + (1-2)^2}$

$= \sqrt{36 + 1}$

$= \sqrt{37}$

$d_{PQ} = \sqrt{5^2 + 1^2}$

$= \sqrt{25 + 1}$

$= \sqrt{26}$

∵ all side lengths are different

∴ triangle is scalene

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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).

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Assigned Work:

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

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