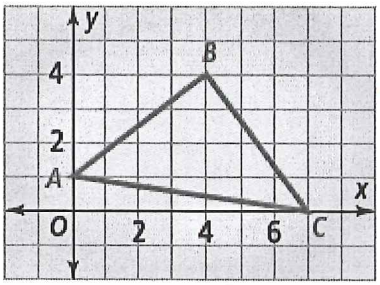
Name Key! Triangles – Day ____

Triangle Coordinate Geometry Examples Day 1

1. Classify the triangle as scalene, equilateral, or isosceles. The determine if the triangle is a right triangle.



Work:

$3^2+4^2=AB^2$

$9+16=AB^2$

$\sqrt{25}=AB$

$5=AB$

$3^2+4^2=BC^2$

$5=BC$

$AB \cong BC$

$1^2+7^2=AC^2$

$50=AC^2$

$\sqrt{50}=AC$

$5\sqrt{2}=AC$

$\sqrt{50}$ → $\sqrt{25}$ $\sqrt{2}$ → 5

Slope AB = $\frac{3}{4}$

Slope BC = $-\frac{4}{3}$ } $AB \perp BC$!!

Slope AC = $-\frac{1}{7}$

Conclude:

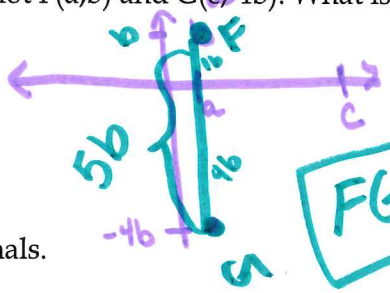
$AB \cong BC \therefore \triangle ABC$ is an isosceles $\triangle$.

$AB \perp BC \therefore \triangle ABC$ is a Right $\triangle$

$\triangle ABC$ is a Right Isosceles Triangle!

2. a.) Plot F(1,4) and G(-3,4). What is the length of FG? b.) Plot F(a,b) and G(c,-4b). What is the length of FG?

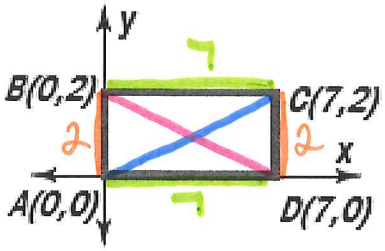
FG = 4 units



FG = 5b units

3.) ABCD is a rectangle plotted with the vertices below.

a.) Find the lengths of ALL FOUR SIDES and BOTH Diagonals.



AD = 7

BC = 7

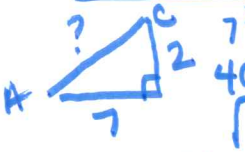
AB = 2

CD = 2

$AC = \sqrt{53}$

$BD = \sqrt{53}$

Find AC



$7^2+2^2=x^2$

$49+4=x^2$

$\sqrt{53}=x$

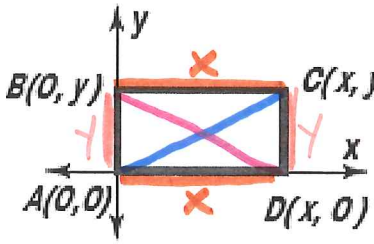
Find BD

$7^2+2^2=BD^2$

$\sqrt{53}=BD$

ABCD is a rectangle plotted with the vertices below.

b.) Find the lengths of ALL FOUR SIDES and BOTH Diagonals.



AB = y

CD = y

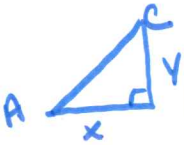
BC = x

AD = x

$AC = \sqrt{x^2+y^2}$

$BD = \sqrt{x^2+y^2}$

Find AC

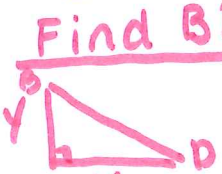


$x^2+y^2=AC^2$

$\sqrt{x^2+y^2}=AC$

Can't CLT so leave as is ★ take ↑

Find BD



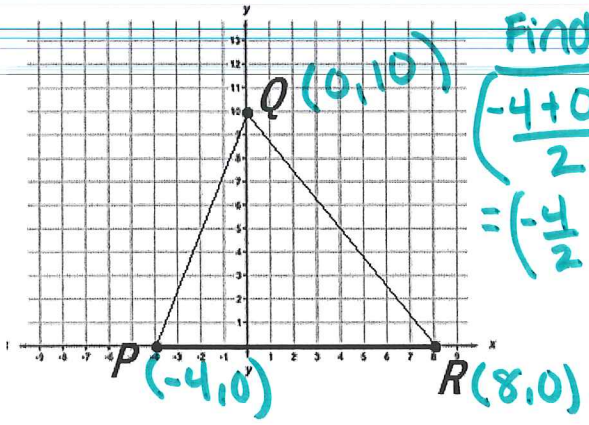
$x^2+y^2=BD^2$

$\sqrt{x^2+y^2}=BD$

4. M and N are midpoints of QP and QR respectively for ΔPQR. P(-4,0), Q(0,10), and R(8,0).

a.) Find the coordinates of midpoints M and N. To check midpoints, use the midpoint formula.

midpoint Formula $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

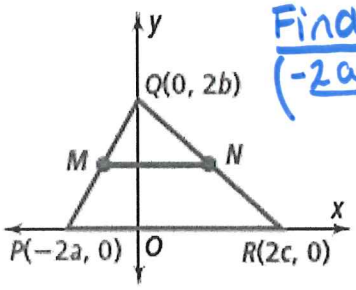


Find M: $\left(\frac{-4+0}{2}, \frac{0+10}{2}\right) = \left(-\frac{4}{2}, \frac{10}{2}\right) = M(-2,5)$

Find N: $\left(\frac{8+0}{2}, \frac{0+10}{2}\right) = \left(\frac{8}{2}, \frac{10}{2}\right) = N(4,5)$

M: (-2,5) N: (4,5)

b.) M and N are midpoints of QP and QR respectively.
Find the coordinates of midpoints M and N. To check midpoints, use the midpoint formula.



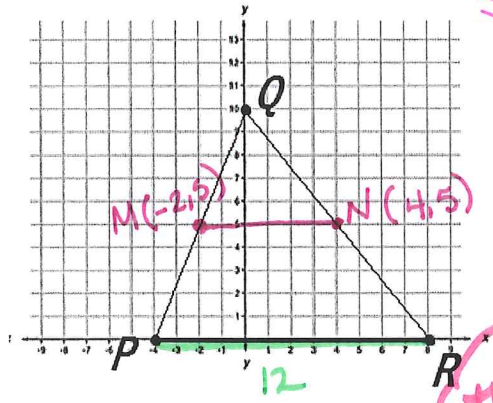
Find M: $\left(\frac{-2a+0}{2}, \frac{0+2b}{2}\right) = \left(-\frac{2a}{2}, \frac{2b}{2}\right) = M(-a,b)$

Find N: $\left(\frac{2c+0}{2}, \frac{0+2b}{2}\right) = \left(\frac{2c}{2}, \frac{2b}{2}\right) = N(c,b)$

M: (-a,b) N: (c,b)

5. M and N are midpoints of QP and QR respectively for ΔPQR. P(-4,0), Q(0,10), and R(8,0). Record your midpoints from the previous question.

a.)Is MN || PR? Why or why not. SHOW MATH! To check parallel, we need to look at slopes!.



Some slopes mean parallel lines!

Slope PR $= \frac{0-0}{-4-8} = \frac{0}{-12} = 0$ (rise / run)

Slope PR = 0

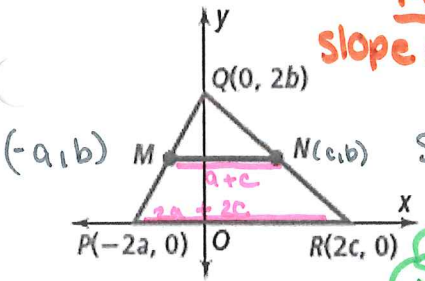
Slope MN $= \frac{5-5}{-2-4} = \frac{0}{-6} = 0$

Slope MN = 0

Slope PR and slope MN are the same so MN // PR

Slope formula! $\frac{y_2-y_1}{x_2-x_1} = \frac{\text{rise}}{\text{run}}$

b.) Record your midpoints from the previous question. Is MN || PR? Why or why not. SHOW MATH! To check parallel, we need to look at Slopes!.



Slope MN = 0

Formulas:

Slope MN $= \frac{b-b}{-a-c} = \frac{0}{-a-c} = 0$

Slope PR $= \frac{0-0}{-2a-2c} = \frac{0}{-2a-2c} = 0$

Slope PR = 0

Some slopes ∴ MN // PR

Rise/run

Slope MN $= \frac{0}{a+c} = 0$

Slope MN = 0

Slope PR $= \frac{0}{2a+2c} = 0$

Slope PR = 0