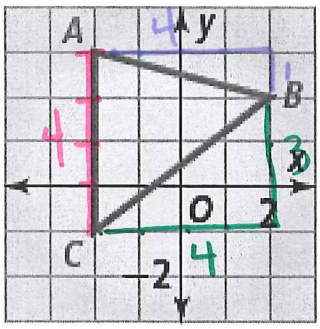
Name Key Hour: _____

# Practice Triangle Coordinate Geometry Day 1

**Determine whether $\triangle ABC$ is *scalene, isosceles,* or *equilateral.* Explain.**

**1.**




Work:

$1^2+4^2=AB^2$

$1+16=AB^2$

$\boxed{\sqrt{17}=AB}$

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

$1+16=BC^2$

$\sqrt{25}=BC$

$\boxed{5=BC}$

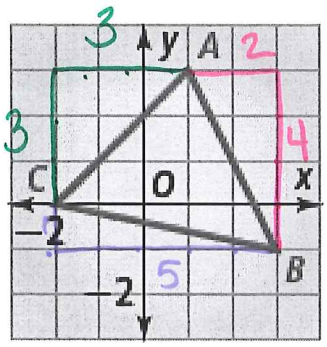
$\boxed{AC=4}$ Just count the units!

Conclude:

No sides are $\cong$

$\therefore \triangle ABC$ is a Scalene $\triangle$

**2.**




Work:

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

$4+16=AB^2$

$\sqrt{20}=AB$

$\boxed{2\sqrt{5}=AB}$

$1^2+5^2=BC^2$

$1+25=BC^2$

$\boxed{\sqrt{26}=BC}$

$3^2+3^2=AC^2$

$9+9=AC^2$

$\sqrt{18}=\sqrt{AC^2}$

$\boxed{3\sqrt{2}=AC}$

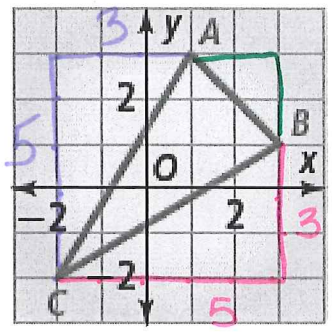
$\sqrt{18}$ $\sqrt{9}$ 3 $\sqrt{2}$

Conclude:

No sides are $\cong$

$\therefore \triangle ABC$ is a Scalene $\triangle$

**3.**




Work:

$2^2+2^2=AB^2$

$4+4=AB^2$

$\sqrt{8}=AB$

$\boxed{2\sqrt{2}=AB}$

$\sqrt{8}$ $\sqrt{4}$ 2 $\sqrt{2}$

$3^2+5^2=BC^2$

$9+25=BC^2$

$\boxed{\sqrt{34}=BC}$

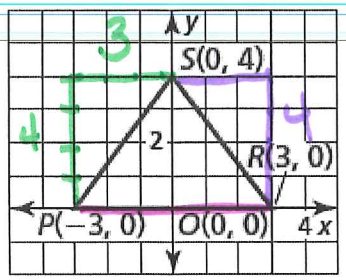
$3^2+5^2=AC^2$

$\boxed{\sqrt{34}=AC}$

Conclude:

$AC \cong BC$ $\therefore$ $\triangle ABC$ is an isosceles $\triangle$

2. Find the SLOPES of ALL three sides of the triangle.




Slope PR $= \frac{0-0}{-3-3} = \frac{0}{-6} = 0$ $\boxed{\text{Slope PR} = 0}$

slope PS $= \frac{4}{3}$ or $\frac{4-0}{0--3} = \frac{4}{3}$ $\boxed{\text{Slopes PS} = \frac{4}{3}}$

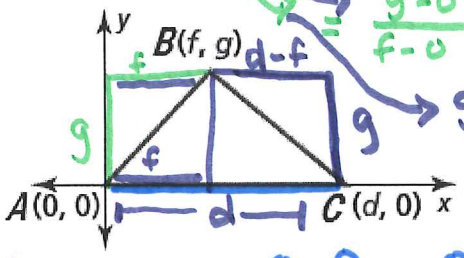
Slope SR $= \frac{-4}{3}$ $\boxed{\text{Slope SR} = \frac{-4}{3}}$

or $\frac{4-0}{0-3} = -\frac{4}{3}$

No ⊥ slopes ∴ ΔPSR is NOT a right ▲

3. Find the SLOPES of ALL three sides of the triangle.

w/ Formula!




Slope AB $= \frac{\text{rise}}{\text{run}} = \frac{g}{f}$

$= \frac{g-0}{f-0} = \frac{g}{f}$

Slope BC $= \frac{0-g}{d-f} = \frac{-g}{d-f}$

Slope AC $= \frac{0-0}{d-0} = \frac{0}{d} = 0$

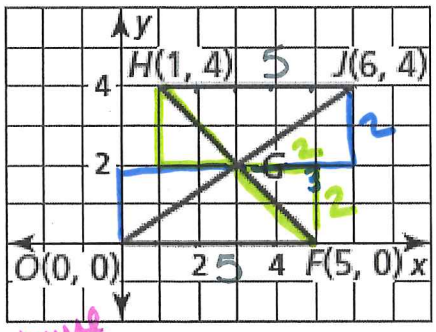
No ⊥ Slopes ∴ ΔABC is NOT a Right Δ

$\boxed{\text{Slope AC} = 0}$

$\boxed{\text{Slope AB} = \frac{g}{f}}$

$\boxed{\text{Slope BC} = \frac{-g}{d-f}}$

4. Given the two triangles below, show your math to determine what 3 PAIRS of sides are congruent.




must have math

HJ = 5
FO = 5 } Just counted!

HJ ≅ FO

$2^2 + 2^2 = GF^2$

$\boxed{2\sqrt{2} = GF}$

$2^2 + 2^2 = GH^2$

$\boxed{2\sqrt{2} = GH}$

GF ≅ GH

$3^2 + 2^2 = GJ^2$

$9 + 4 = GJ^2$

$\boxed{\sqrt{13} = GJ}$

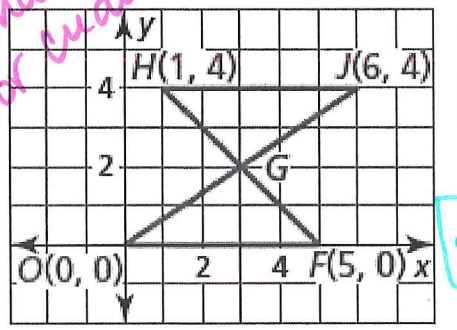
$3^2 + 2^2 = GO^2$

$\boxed{\sqrt{13} = GO}$

GJ ≅ GO

5. Determine if G is the midpoint of JO AND HF. Explain your mathematics.

need math for credit!




Find midpoint of JO

$\left(\frac{6+0}{2}, \frac{4+0}{2}\right) = \left(\frac{6}{2}, \frac{4}{2}\right)$

$(3, 2) \rightarrow$ This is G!!

$\boxed{\therefore \text{ G is the midpoint of JO}}$

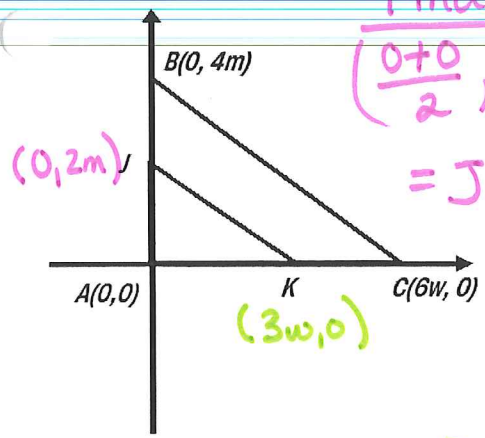
Find midpt of HF

$\left(\frac{1+5}{2}, \frac{4+0}{2}\right) = \left(\frac{6}{2}, \frac{4}{2}\right) = (3, 2)$ This is G!!

$\boxed{\therefore \text{ G is the midpt of HF}}$

6. J and K are midpoints of AB and AC respectively.

a.) Find the coordinates of midpoints J and K.




Find J

$\left(\frac{0+0}{2}, \frac{0+4m}{2}\right) = \left(\frac{0}{2}, \frac{4m}{2}\right)$

$= J(0, 2m)$

J: (0, 2m) K: (3w, 0)

Find K:

$\left(\frac{0+6w}{2}, \frac{0+0}{2}\right) = \left(\frac{6w}{2}, \frac{0}{2}\right)$

$= K(3w, 0)$

b.) Is JK | | BC? Why or why not. SHOW MATH!

Slope JK $= \frac{0-2m}{3w-0} = \frac{-2m}{3w}$

$\boxed{\text{Slope } JK = \frac{-2m}{3w}}$

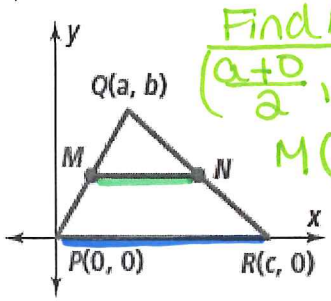
slope BC $= \frac{0-4m}{6w-0} = \frac{-4m}{6w} = \frac{-2m}{3w}$ ✓

$\boxed{\text{Slope } BC = \frac{-2m}{3w}}$

JK and BC have the SAME Slopes ∴ JK // BC

7. M and N are midpoints of QP and QR respectively.

a.) Find the coordinates of midpoints M and N.




Find M

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

$M(.5a, .5b)$

Find N:

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

M: $\left(\frac{a}{2}, \frac{b}{2}\right)$ $(.5a, .5b)$ N: $\left(\frac{a+c}{2}, \frac{b}{2}\right)$ $(.5(a+c), .5b)$

b.) Is MN | | PR? Why or why not. SHOW MATH!

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

$\boxed{\text{Slope } MN = 0}$

slope PR $= \frac{0}{c} = 0$

$\boxed{\text{Slope } PR = 0}$

MN and PR have the Same Slope ∴

MN // PR