

5.8 Coordinate Proofs CYU

Use when you get it right all by yourself

S Use when you did it all by yourself, but made a silly mistake

H Use when you could do it alone with a little help from teacher or peer

G Use when you completed the problem in a group

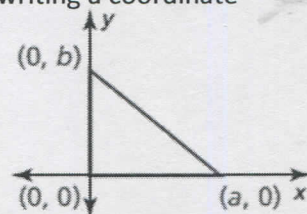
X Use when a question was attempted but wrong (get help)

N Use when a question was not even attempted

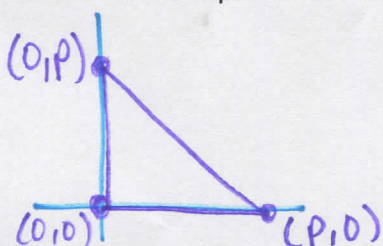
CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Justification of figure placement	1	2, 3	
Placement of figure on a coordinate plane		2, 3	
Paragraph proof plan			5
Finding side lengths from coordinate planes		4	
Graphing coordinates	6		
Midpoint formula	6		
Slope formula	6		
Distance formula	6, 7		

1. **WRITING** Explain why it is convenient to place a right triangle on the grid as shown when writing a coordinate proof.

zeros are expressions, side lengths are same as coordinates

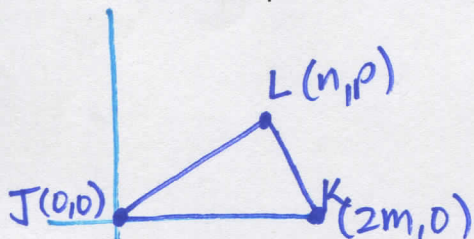


2. Place an isosceles right triangle with leg length p in a coordinate plane in a convenient way. Assign coordinates to each vertex. Explain the advantages of your placement.



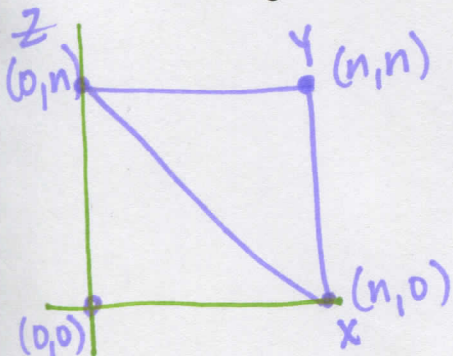
vertical & horizontal are easier

3. Place a scalene triangle with one side length of $2m$ in a coordinate plane in a convenient way. Assign coordinates to each vertex. Explain the advantages of your placement.



horizontal segments ≠ distances from the origin.

4. Place the figure in a coordinate plane and find the side length n of a square. Find the length of the diagonal.

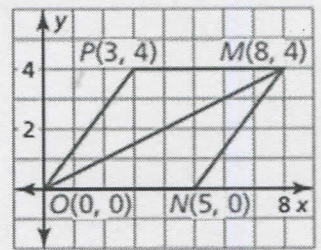


$$xz = \sqrt{(n-0)^2 + (0-n)^2} = \boxed{n\sqrt{2} \text{ unit}}$$

5. Write a plan for the proof.

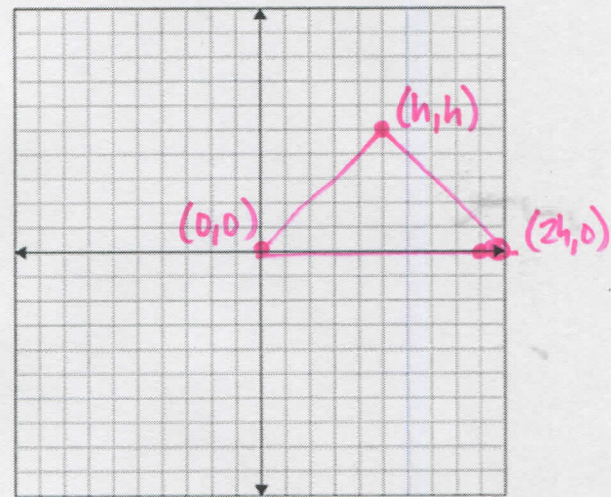
Given: Coordinates of vertices of $\triangle OPM$ & $\triangle ONM$

Prove: $\triangle OPM$ & $\triangle ONM$ are isosceles triangles



Find the lengths of \overline{OP} , \overline{PM} , \overline{MN} , & $\frac{1}{2}\overline{NO}$
 so that $\overline{OP} \cong \overline{PM}$ & $\overline{MN} \cong \frac{1}{2}\overline{NO}$.

6. Graph the triangle with the given vertices. Find the length and the slope of each side of the triangle. Then find the coordinates of the midpoint of each side. Is the triangle a right triangle? isosceles? Explain. (Assume all variables are positive and m does not equal n .)



$A(0, 0)$, $B(h, h)$, & $C(2h, 0)$

$AB = \sqrt{(h-0)^2 + (h-0)^2} = h\sqrt{2}$

$BC = h\sqrt{2}$

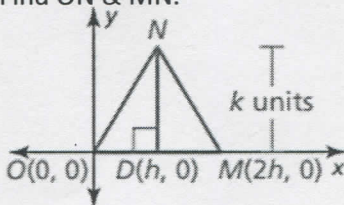
$AC = 2h$

Mdpt
 $\overline{AB} = (\frac{h}{2}, \frac{h}{2})$
 $\overline{BC} = (\frac{3h}{2}, \frac{h}{2})$

$m_{\overline{AB}} = 1$ $m_{\overline{BC}} = -1$ $m_{\overline{AC}} = 0$ $\overline{AC} = (h, 0)$
 $\triangle ABC$ is a right isosceles \triangle .

7. Find the coordinates of any unlabeled vertices. Then find the indicated length(s).

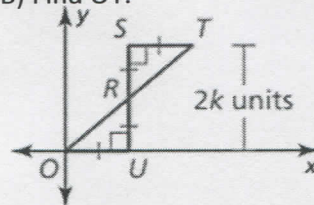
a) Find ON & MN.



$N(h, k)$
 $ON = \sqrt{h^2 + k^2}$

$MN = \sqrt{h^2 + k^2}$

B) Find OT.



$O(0,0)$ $U(k,0)$
 $R(k,k)$ $S(k,2k)$
 $T(2k,2k)$

$OT = 2k\sqrt{2}$

CYU Reflection: How far can you go: basic, intermediate, or advanced?

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.

