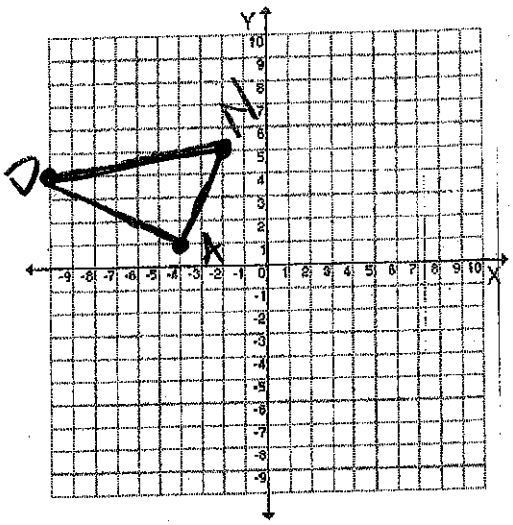
Key

↳ Pythag Theorem

Homework

1. Triangle *DAN* has coordinates *D*(−10, 4), *A*(−4, 1), and *N*(−2, 5). Using coordinate geometry, prove that triangle *DAN* is a right triangle.



$DN = \sqrt{(-10+2)^2+(4-5)^2} = \sqrt{65}$

$NA = \sqrt{(-2+4)^2+(5-1)^2} = \sqrt{20}$

$AD = \sqrt{(-4+10)^2+(1-4)^2} = \sqrt{45}$

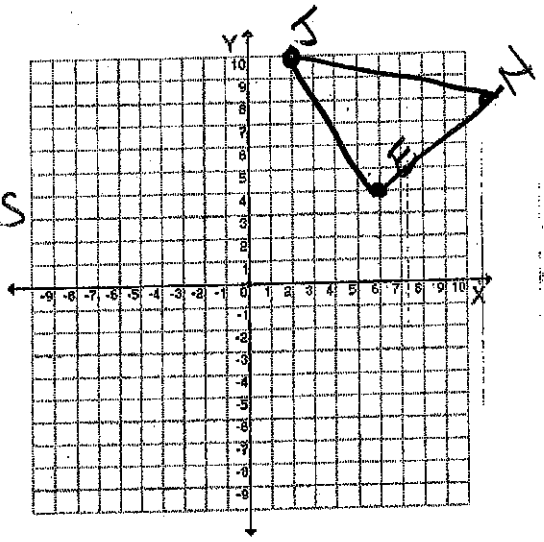
$(\overline{NA})^2 + (\overline{AD})^2 = (DN)^2$

$(\sqrt{20})^2 + (\sqrt{45})^2 = (\sqrt{65})^2$ ✓

$20 + 45 = 65$

* DAN is Rt Δ b/c $(\overline{NA})^2 + (\overline{AD})^2 = (DN)^2$

2. The vertices of triangle *JEN* are *J*(2, 10), *E*(6, 4), and *N*(12, 8). Use coordinate geometry to prove that triangle *JEN* is an isosceles right triangle.



* Pythag
* 2 ≅ sides

$\overline{JN} = \sqrt{(2-12)^2+(10-8)^2} = \sqrt{104}$

$\overline{NE} = \sqrt{(12-6)^2+(8-4)^2} = \sqrt{52}$

$\overline{EJ} = \sqrt{(6-2)^2+(4-10)^2} = \sqrt{52}$

$\overline{NE} \cong \overline{EJ}$ ✓

$(\overline{NE})^2 + (\overline{EJ})^2 = (\overline{JN})^2$

$(\sqrt{52})^2 + (\sqrt{52})^2 = (\sqrt{104})^2$

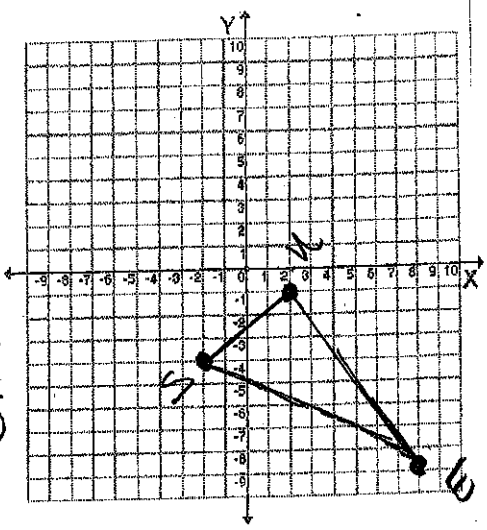
$104 = 104$ ✓

* JEN is a Rt isosceles triangle b/c $(\overline{NE})^2 + (\overline{EJ})^2 = (\overline{JN})^2$ and $\overline{NE} \cong \overline{EJ}$

3. The coordinates of the vertices of triangle *SUE* are $S(-2, -4)$, $U(2, -1)$ and $E(8, -9)$. Using coordinate geometry, prove that

Pythag → a. triangle *SUE* is a right triangle.

no ≅ sides → b. triangle *SUE* is *not* an isosceles right triangle.



$\overline{SU} = \sqrt{(-2-2)^2 + (-4+1)^2} = \sqrt{25}$ (5)

$\overline{UE} = \sqrt{(2-8)^2 + (-1+9)^2} = \sqrt{100}$ (10)

$\overline{ES} = \sqrt{(8+2)^2 + (-9+4)^2} = \sqrt{125}$

$(\overline{SU})^2 + (\overline{UE})^2 = (\overline{ES})^2$

$5^2 + 10^2 = (\sqrt{125})^2$

$125 = 125$ ✓

* SUE is a right triangle b/c $(\overline{SU})^2 + (\overline{UE})^2 = (\overline{ES})^2$ but not isosceles b/c no ≅ sides

4. Which set of numbers does *not* represent the sides of a right triangle?

1) {6, 8, 10}
2) {8, 15, 17}
3) {8, 24, 25}
4) {15, 36, 39}

1.) $6^2 + 8^2 = 10^2$ yes

2.) $8^2 + 15^2 = 17^2$ yes

3.) $8^2 + 24^2 \neq 25^2$ no

4.) $15^2 + 36^2 = 39^2$ yes