

Directions: Prove each shape is a right triangle by showing that the triangle has a right angle.

1) Given: A(1, 1), B(4, 4), & C(5, -3)

Prove: ABC is a right triangle

① Using Pyth. Th:

$$\overline{AB} = 3^2 + 3^2 = x^2$$

$$18 = x^2$$

$$3\sqrt{2} = x$$

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

$$3\sqrt{2}^2 + 4\sqrt{2}^2 \square 5\sqrt{2}^2$$

$$18 + 32 \square 50$$

$$50 = 50$$

$$\checkmark \text{ yes } a^2 + b^2 = c^2$$

$$\overline{AC} = 4^2 + 4^2 = x^2$$

$$32 = x^2$$

$$4\sqrt{2} = x$$

$$\boxed{4\sqrt{2}}$$

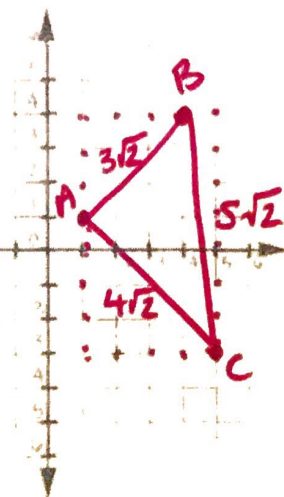
② Finding slopes to see if sides are  $\perp$ .

$$\text{AB slope: } \frac{3}{3} = 1$$

opposite reciprocals

$$\text{AC slope: } -\frac{4}{4} = -1$$

$\checkmark$



2) Given: D(-2, 2), E(1, 4), & F(3, 1)

Prove: DEF is a right triangle

① Pyth. Th.

$$\overline{DE} = \sqrt{13}$$

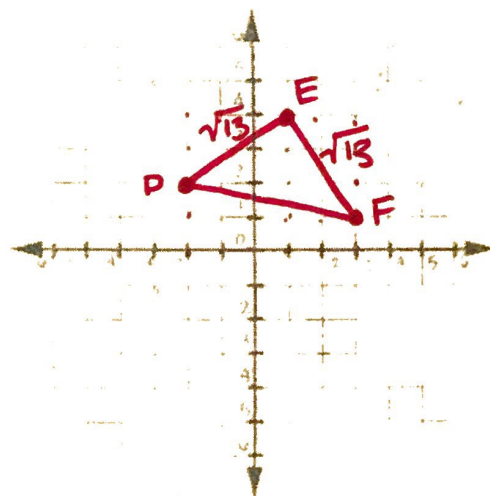
$$\overline{EF} = \sqrt{13}$$

$$\overline{DF} = \sqrt{26}$$

$$\sqrt{13}^2 + \sqrt{13}^2 \square \sqrt{26}^2$$

$$13 + 13 \square 26$$

$$26 = 26 \checkmark$$



② Slope of  $\overline{DE}$ :  $\left(\frac{2}{3}\right)$

opposite reciprocals

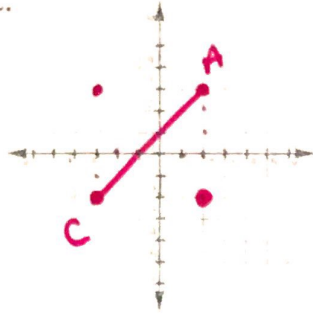
Slope of  $\overline{EF}$ :  $\left(-\frac{3}{2}\right)$

$\checkmark$

Directions: If  $\overline{AC}$  is the hypotenuse of a right triangle, find two ordered pairs that could represent Point B in  $\triangle ABC$ .

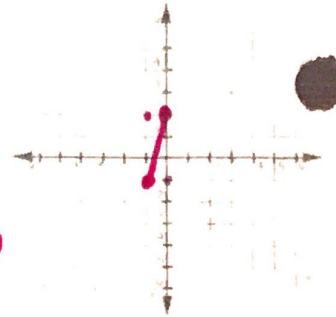
3) A(2, 3) and C(-3, -2)

B(-3, 3) or  
B(2, -2)



4) A(-1, -1) & C(0, 2)

B(-1, 2) or  
B(0, -1)



Directions: Prove each triangle is a right triangle by using Pythagorean Theorem.

\*use distance

5) A(0, 1), B(5, 2), & C(3, 4)

Formula

$$\overline{AB} : \sqrt{(5-0)^2 + (2-1)^2} = \sqrt{26}$$

$$\overline{BC} : \sqrt{(3-5)^2 + (4-2)^2} = 2\sqrt{2}$$

$$\overline{AC} : \sqrt{(3-0)^2 + (4-1)^2} = 3\sqrt{2}$$

$$2\sqrt{2}^2 + 3\sqrt{2}^2 \square \sqrt{26}^2$$

$$8 + 18 \square 26$$

$$26 = 26 \checkmark$$

6) A(-2, -3), B(-1, 1), & C(3, 0)

$$\overline{AB} : \sqrt{(-1+2)^2 + (1+3)^2} = \sqrt{17}$$

$$\overline{BC} : \sqrt{(3+1)^2 + (0-1)^2} = \sqrt{17}$$

$$\overline{AC} : \sqrt{(3+2)^2 + (0+3)^2} = \sqrt{34}$$

$$\sqrt{17}^2 + \sqrt{17}^2 \square \sqrt{34}^2$$

$$17 + 17 \square 34$$

$$34 = 34 \checkmark$$

Directions: Complete each proof.

7) Prove that D(-2, -2), E(5, -1), F(1, 2) is an isosceles right triangle.

$$\overline{DF} : 4^2 + 3^2 = x^2 \quad \boxed{5}$$

$$25 = x^2$$

$$5 = x$$

Slope of  $\overline{DF} : \left(\frac{4}{3}\right)$

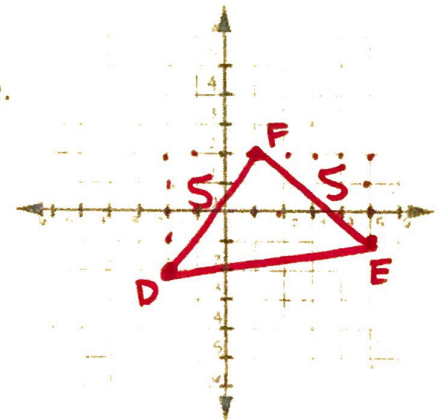
$$\overline{FE} : 4^2 + 3^2 = x^2 \quad \boxed{5}$$

$$25 = x^2$$

$$5 = x$$

Slope of  $\overline{FE} : \left(\frac{3}{-4}\right)$  opp. rec.

yes, isosceles rt  $\triangle$ .



8) Prove that M(-2, 4), N(4, 4), P(-2, -4) is a scalene right triangle.

$$\overline{MP} = 8$$

Slope of  $\overline{MP} : \underline{\text{undefined}}$

$$\overline{MN} = 6$$

Slope of  $\overline{MN} : \underline{\text{zero}}$

opp. reciprocals

yes, scalene rt  $\triangle$ .

