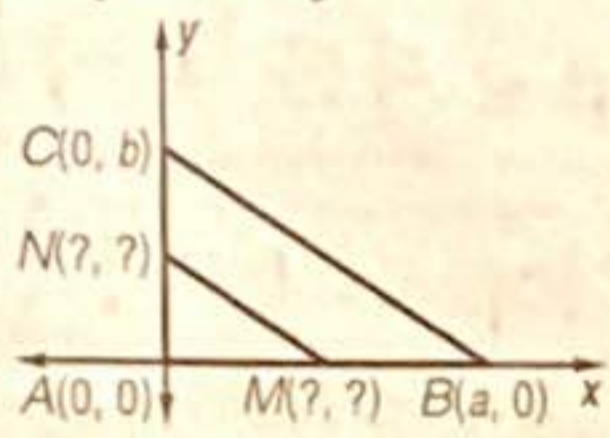## 4.7 Graded Assignment

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Multiple Choice
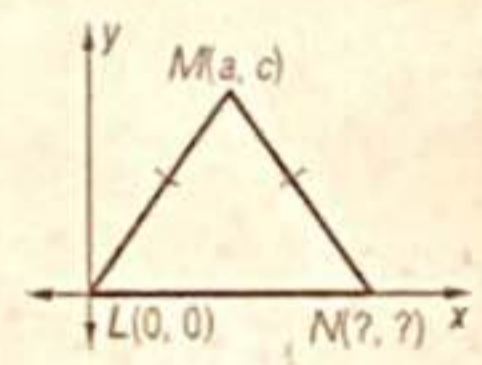*Identify the choice that best completes the statement or answers the question.*

B

1. $\overline{MN}$ joins the midpoint of $\overline{AB}$ and the midpoint of $\overline{AC}$ in $\triangle ABC$. Find the coordinates of M and N respectively.

+2

C(0, b)
N(?, ?)
A(0, 0)   M(?, ?)   B(a, 0)   x

    a. $M(\frac{1}{2}a, \frac{1}{2}b), N(\frac{1}{2}a, \frac{1}{2}b)$ c. $M(0, \frac{a}{2}), N(\frac{b}{2}, 0)$

    b. $M(\frac{a}{2}, 0), N(0, \frac{b}{2})$ d. $M(\frac{1}{2}, 0), N(0, \frac{1}{2})$
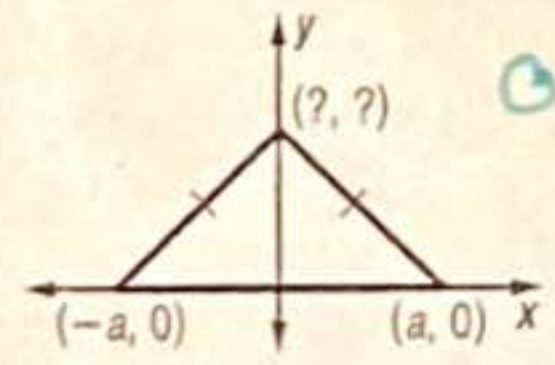
B

2. What are the missing coordinates of this triangle?

+2

M(a, c)
L(0, 0)   N(?, ?)   x

    a. $(2a, 2c)$ c. $(0, 2a)$

    b. $(2a, 0)$ d. $(a, 2c)$

D

3. What are the missing coordinates of the triangle?

+2

(?, ?)   0, c
(−a, 0)   (a, 0)   x

    a. $(a, 0)$ c. $(c, 0)$

    b. $(b, 0)$ **d.** $(0, c)$

Write a coordinate proof for the following proofs.

✓ $2 \cong$ sides

4. Given: $\triangle ABC$.
   Prove: $\triangle ABC$ is an **isosceles** triangle

A(0, k)
k
C(−h, 0)   h   B(h, 0)   x
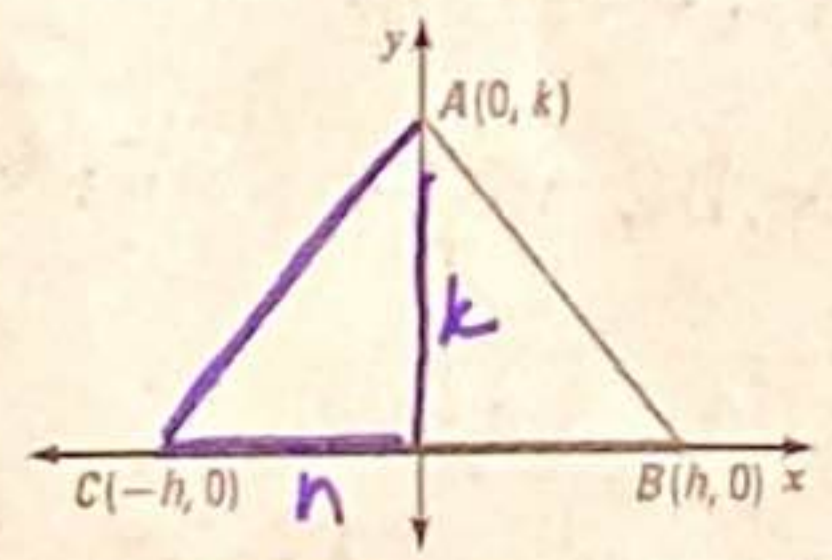
$h^2 + k^2 = AC^2$ (+1)

$\sqrt{h^2 + k^2} = AC$
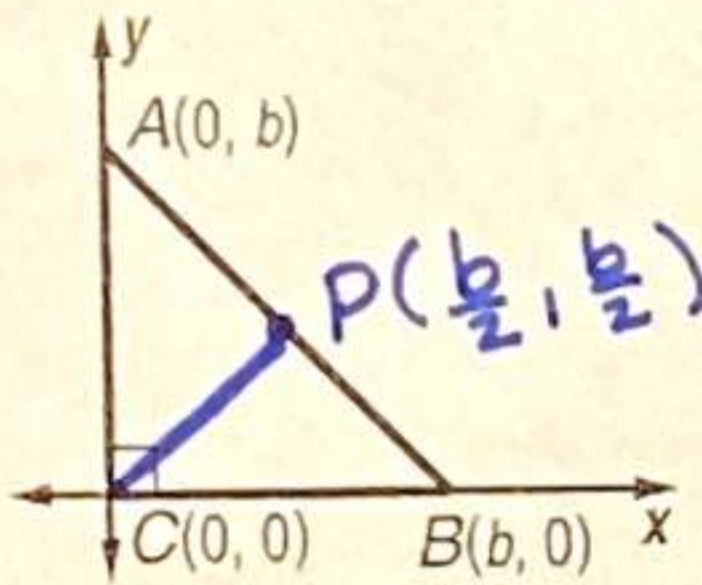
$h^2 + k^2 = AB^2$

$\sqrt{h^2 + k^2} = AB$ (+1)

$AC \cong AB$ subs (+1)

$\triangle ABC$ is isosceles by (+1) def OR because $AC \cong AB$

1

+5

5. $\overline{CP}$ joins point C in isosceles right $\triangle ABC$ to the midpoint P, of $\overline{AB}$. (a)Name the coordinates of P *and plot it on your image*, (b)then **PROVE** $\overline{AB} \perp \overline{CP}$.

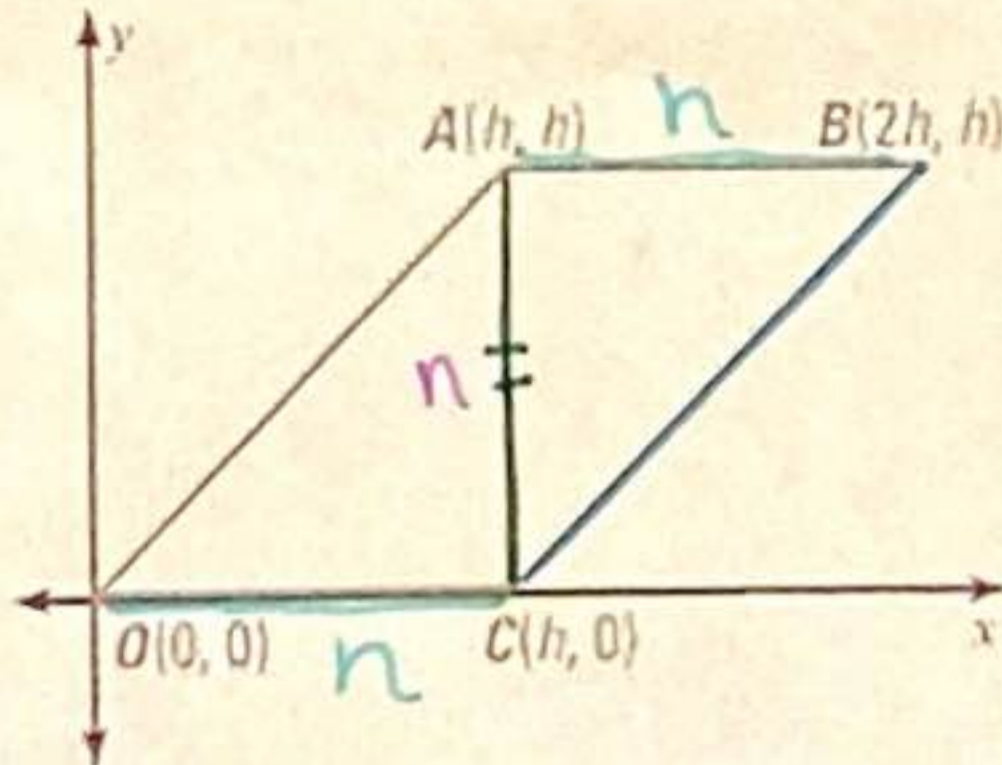(a) P ($\frac{b}{2}$, $\frac{b}{2}$) **+2**

(b) **PROVE** $\overline{AB} \perp \overline{CP}$:

Slope AB $= -\frac{b}{b}$ ⇒ Slope AB $= -1$ **+2**

Slope CP $= \frac{\frac{b}{2}}{\frac{b}{2}}$ Slope CP $= 1$

∴ AB⊥CP **+1**

A(0, b)
P($\frac{b}{2}$, $\frac{b}{2}$)
C(0, 0)   B(b, 0)

+4

Example

6. Given: The coordinates of $\triangle OAC$ and $\triangle BCA$
Prove: $\triangle OAC \cong \triangle BCA$

A(h, h) h B(2h, h)
n
O(0, 0) n C(h, 0)

AB=h
OC=n } AB ≅ OC Subs **+1**

AC ≅ AC reflexive **+1**

$h^2 + h^2 = OA^2$ $h^2 + n^2 = BC^2$
$2h^2 = OA^2$ $|h|\sqrt{2} = BC$
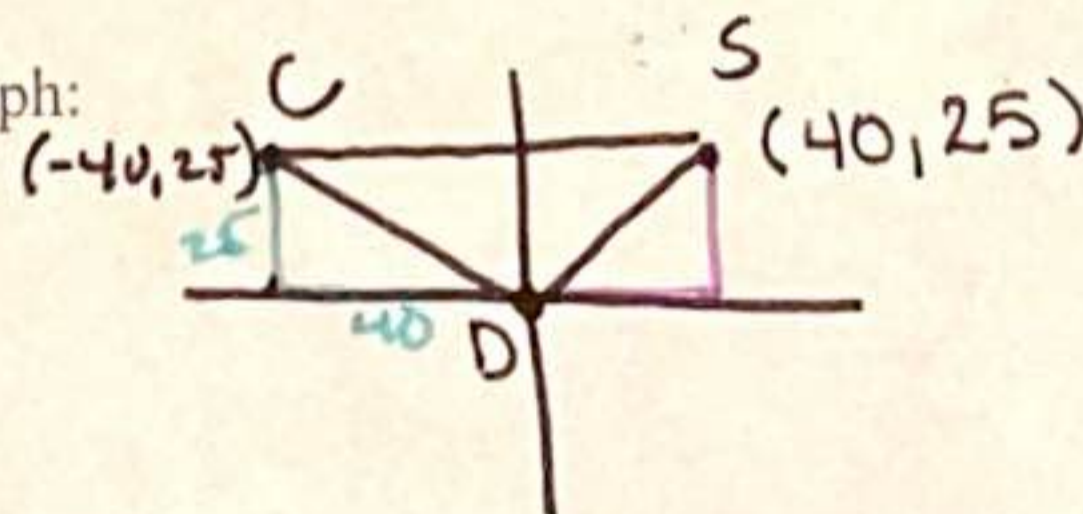$h\sqrt{2} = OA$ OA ≅ BC Subs **+1**

$\triangle OAC \cong \triangle BCA$ by SSS **+1**

+7

7. A sailboat is located 40 meters to the east and 25 meters to the north of the dock. A canoe is located 40 meters to the west and 25 meters to the north of the same dock.

Show your graph:

C (-40, 25)   S (40, 25)
25
40   D

Does the sailboat, the canoe, and the dock form an isosceles triangle? Show (below here), your work and short explaination why or why not.

CS=80m

$40^2 + 25^2 = SD^2$ $40^2 + 25^2 = CD^2$
$\sqrt{2225} = SD$ $\sqrt{2225} = CD$
+1 $5\sqrt{89}m = SD$ **+1** $5\sqrt{89}m = CD$

SD ≅ CD subs
∴ △CDS is isosceles. **+1**
by def.

Does it form a right triangle? Show (below here), your work and short explaination why or why not.

Slope DS $= \frac{25}{40}$ Slope DS $= \frac{5}{8}$ **+1**

Slope DC $= -\frac{25}{40}$ Slope DC $= -\frac{5}{8}$ **+1**

Slope CS = 0 **+1**

No ⊥ Slopes ∴ △CDS is not a Right△ **+1**