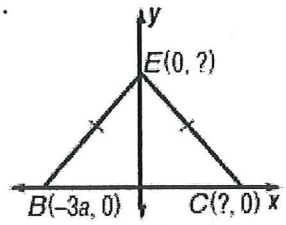
Acc Geometry
Practice 4.7 Coordinate Proof

Name Key
Date

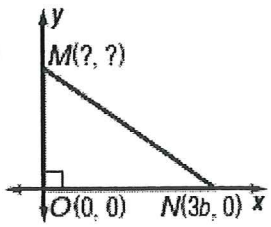
Find the missing coordinates of each triangle.

1.



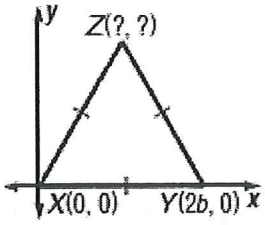
E(0,c)
C(3a,0)

2.



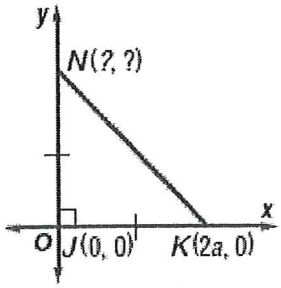
M(0,a)

3.



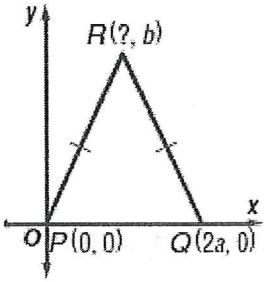
Z(b,c)

4.



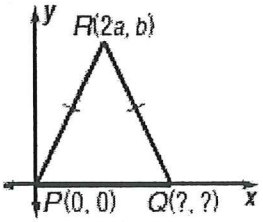
N(0,2a)

5.



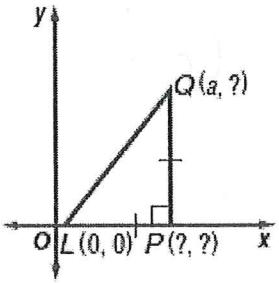
R(a,b)

6.



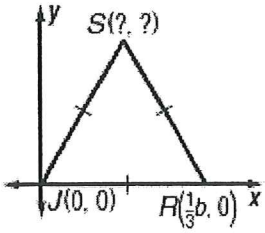
Q(4a,0)

7.



P(a,0)
Q(a,a)

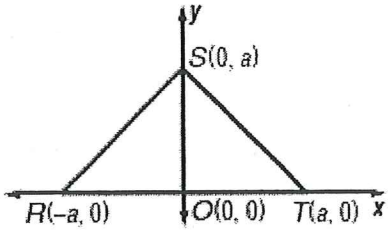
8.



S(⅙b,c)

Use the triangle to the right to answer the following.

9. a). Find the slope of SR and ST.



Slope SR $= \frac{a-0}{0+a} = \frac{a}{a} = 1$

Slope ST $= \frac{a-0}{0-a} = \frac{a}{-a} = -1$

b). What does this tell you about triangle RST?

$\overline{SR} \perp \overline{ST}$ so $m\angle S = 90$ and $\triangle RST$ is a right $\triangle$

c). Find the length of SR and ST.

$SR = \sqrt{(-a)^2 + (a)^2} = \sqrt{a^2+a^2} = \sqrt{2a^2} = |a|\sqrt{2}$

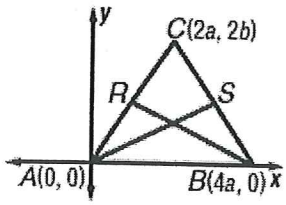
$ST = \sqrt{(-a)^2 + (a)^2} = \sqrt{a^2+a^2} = \sqrt{2a^2} = |a|\sqrt{2}$

d). What does this about triangle RST?

$\overline{SR} \cong \overline{ST}$, so $\triangle RST$ is isosceles

Write a coordinate proof.

10. **Given:** isosceles $\triangle ABC$ with $\overline{AC} \cong \overline{BC}$
R and S are midpoints of legs $\overline{AC}$ and $\overline{BC}$.
Prove: $\overline{AS} \cong \overline{BR}$



$AS = \sqrt{(3a-0)^2 + (b-0)^2}$
$= \sqrt{(3a)^2 + (b)^2}$
$= \sqrt{9a^2 + b^2}$

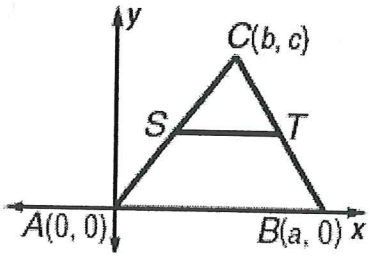
midpoint S $\left(\frac{2a+4a}{2}, \frac{2b+0}{2}\right)$
$(3a, b)$

$BR = \sqrt{(4a-a)^2 + (0-b)^2}$
$= \sqrt{(3a)^2 + (-b)^2}$
$= \sqrt{9a^2 + b^2}$

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

$\therefore \overline{AS} \cong \overline{BR}$

11. **Given:** $\triangle ABC$
S is the midpoint of $\overline{AC}$.
T is the midpoint of $\overline{BC}$.
Prove: $\overline{ST} \parallel \overline{AB}$



slope ST $= \dfrac{\frac{c}{2} - \frac{c}{2}}{\frac{b+a}{2} - \frac{b}{2}} = \dfrac{0}{\frac{a}{2}} = 0$

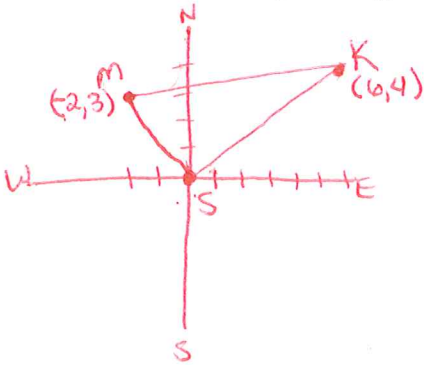
slope AB $= \dfrac{0-0}{a-0} = \dfrac{0}{a} = 0$

$\therefore \overline{ST} \parallel \overline{AB}$

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

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

12. Katrina lives 6 miles east and 4 miles north of her high school. The mall is 2 miles west and 3 miles north of the school. Write a coordinate proof to prove that Katrina's high school, home and the mall form a right triangle.



slope MS $= \dfrac{3-0}{-2-0} = -\dfrac{3}{2}$

slope KS $= \dfrac{4-0}{6-0} = \dfrac{2}{3}$

$\overline{MS} \perp \overline{KS}$, so $\triangle MKS$ is a right $\triangle$.