Practice Triangle Coordinate Geometry

Find the missing coordinates of each triangle.

1.

$E(0, ?)$ $E(0,c)$
$B(-3a, 0)$ $C(?, 0)$ x
$C(3a, 0)$

2.

$M(?, ?)$ $(0, a)$
$O(0, 0)$ $N(3b, 0)$ x

3.

$Z(?, ?)$ (b, c)
c
$X(0, 0)$ $Y(2b, 0)$ x
b b
$(b, 0)$

4.

$N(?, ?)$ $(0, 2a)$
O $J(0, 0)$ $K(2a, 0)$ x

5.

$R(?, b)$ (a, b)
O $P(0, 0)$ $Q(2a, 0)$ x

6.

$R(2a, b)$
$P(0, 0)$ $Q(?, ?)$ x
$(4a, 0)$

7.

$Q(a, ?)$ (a, a)
a
a
O $L(0, 0)$ $P(?, ?)$ x
$(a, 0)$

8.

$S(?, ?)$ $S(\frac{1}{6}b, c)$
$J(0, 0)$ $R(\frac{1}{3}b, 0)$ x
$\frac{1}{2}$ of $\frac{1}{3} = \frac{1}{6}$
$S(\frac{1}{6}b, c)$
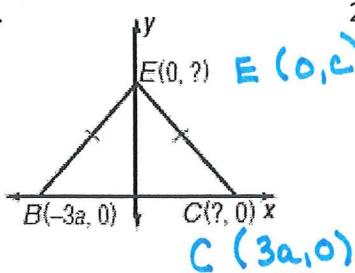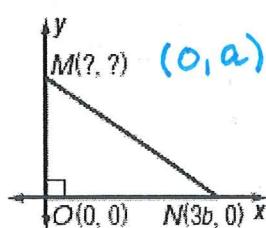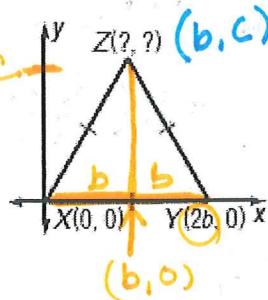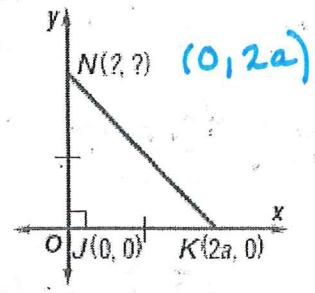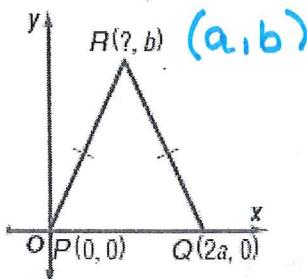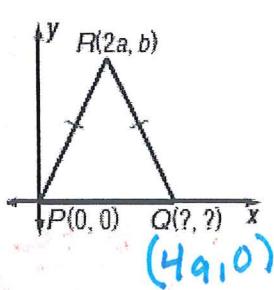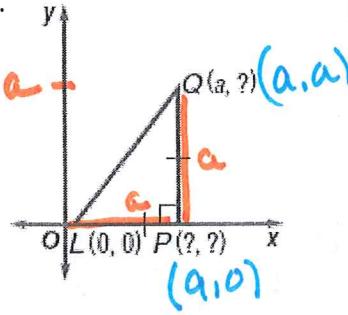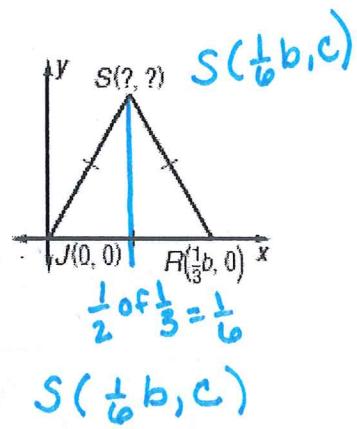
Use the triangle to the right to answer the following.

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

Slope SR $= \frac{a}{a} = 1$
Slope ST $= -\frac{a}{a} = -1$ $\Big\}$ $\perp$ slopes

$S(0, a)$
a a
$R(-a, 0)$ $O(0, 0)$ $T(a, 0)$ x

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

SR $\perp$ ST $\triangle$ RST is a right triangle.

c). Find the length of SR and ST.

$SR^2 = a^2 + a^2$ $ST^2 = a^2 + a^2$
$SR = \sqrt{2a^2}$ $ST^2 = \sqrt{2a^2} = a\sqrt{2}$
$SR = a\sqrt{2}$
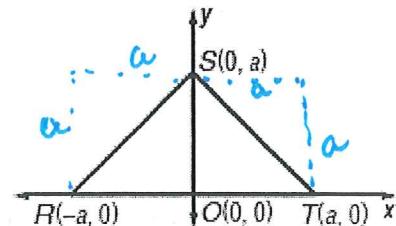
$\sqrt{a^2 + a^2}$

$\therefore$ $\triangle$ RST is a Right isosceles Triangle.

d). What does this about triangle RST?

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

$R\left(\dfrac{0+2a}{2}, \dfrac{0+2b}{2}\right) = \boxed{R(a,b)}$

$S\left(\dfrac{4a+2a}{2}, \dfrac{0+2b}{2}\right) = S\left(\dfrac{6a}{2}, \dfrac{2b}{2}\right)$

$\boxed{= S(3a, b)}$
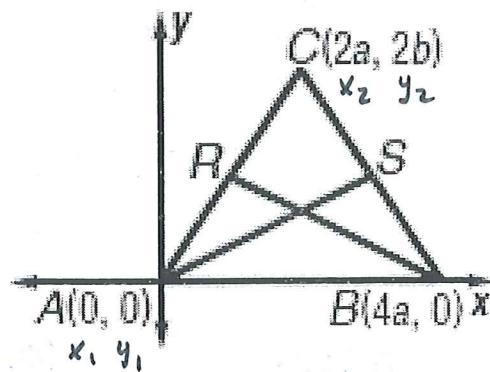
11. **Given:** $\triangle ABC$
    S is the midpoint of $\overline{AC}$.
    T is the midpoint of $\overline{BC}$.

    Find S and T.

$S\left(\dfrac{0+b}{2}, \dfrac{0+c}{2}\right)$

$\boxed{= S\left(\dfrac{b}{2}, \dfrac{c}{2}\right)}$

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

$\boxed{= T\left(\dfrac{b+a}{2}, \dfrac{c}{2}\right)}$
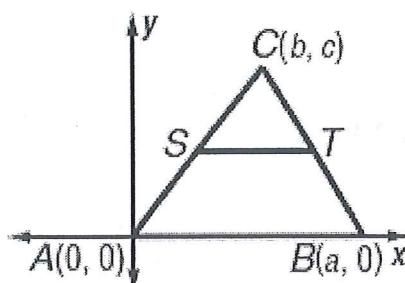
12. Katrina lives 6 miles east and 4 miles north of her high school. The mall is 2 miles west and 3 miles north of the school. Write a coordinate proof to prove that Katrina's high school, home and the mall form a right triangle.
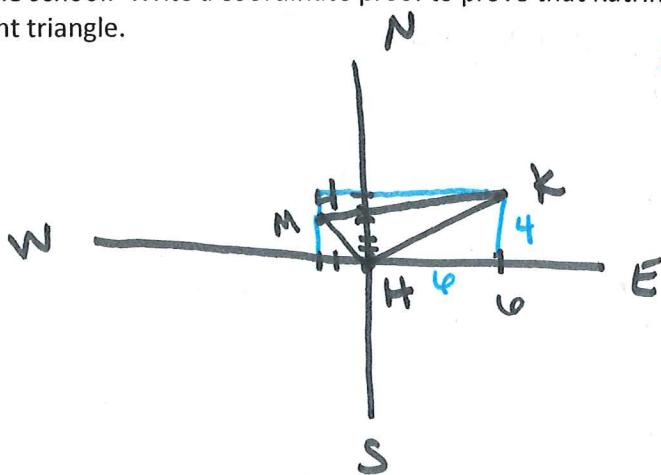
Slope HK $= \dfrac{4}{6} = \dfrac{2}{3}$

Slope MH $= \dfrac{-3}{2}$

Slope MK $= \dfrac{1}{8}$

HK $\perp$ MH $\therefore$ It is

a Right $\triangle$