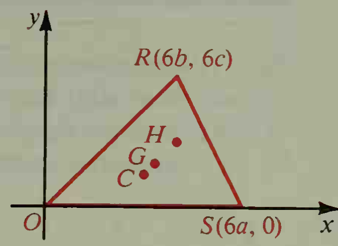
Exercises 12, 13, and 14 refer to the diagram at the right.



12. Prove that the perpendicular bisectors of the three sides of $\triangle ROS$ meet in a point C (called the *circumcenter*) whose coordinates are $\left(3a, \dfrac{3b^2 + 3c^2 - 3ab}{c}\right)$.

13. Prove that the lines containing the altitudes of $\triangle ROS$ intersect in a point $H\left(6b, \dfrac{6ab - 6b^2}{c}\right)$. (*Hint*: Use the procedure of Classroom Exercise 5.)

14. G, the intersection point of the medians of $\triangle ROS$, has coordinates $(2a + 2b, 2c)$. (See Exercise 11.)
Prove each statement.

a. Points C, G, and H are collinear. The line containing these points is called *Euler's Line*. (*Hint*: One way to prove this is to show that slope of $\overline{CG}$ = slope of $\overline{GH}$.)

b. $CG = \frac{1}{3}CH$

Self-Test 2

1. Find the slope and y-intercept of the line $2x - 5y = 20$.

2. Graph the line $2x + 3y = 6$.

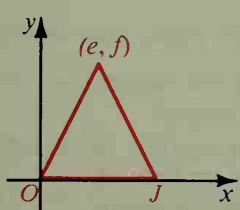
3. Write an equation of the line through $(1, 2)$ and $(5, 0)$.

4. Write an equation of the horizontal line through $(-2, 5)$.

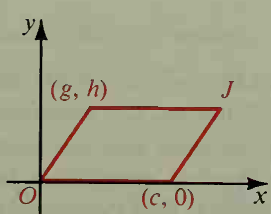
5. Find the intersection point of the lines $y = 3x - 4$ and $5x - 2y = 7$.

State the coordinates of point J without introducing any new letters.

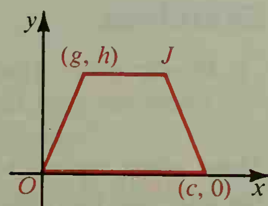
6. Isosceles triangle



7. Parallelogram



8. Isosceles trapezoid



9. The vertices of a quadrilateral are $G(4, -1)$, $O(0, 0)$, $L(2, 6)$, and $D(6, 5)$. Show that quadrilateral $GOLD$ is a parallelogram.