**Please complete the following problems neatly showing your work. You can use scratch paper if you need more space. Number each problem as you will turn in any scratch paper with your test. Please transfer your answers to the answer sheet provided.**

1.   Quadrilateral LMNK has congruent diagonals that bisect each other. Which statement must be true?
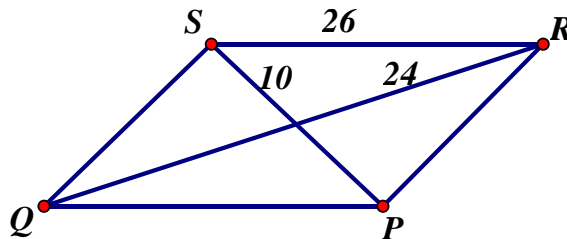   - A. LMNK must be a square.
   - B. LMNK must be a rectangle.
   - C. LMNK must be a rhombus.
   - D. LMNK must be a trapezoid.

2.   MEQT is a parallelogram, but not a rectangle. Which of the following are possible values of x and y?
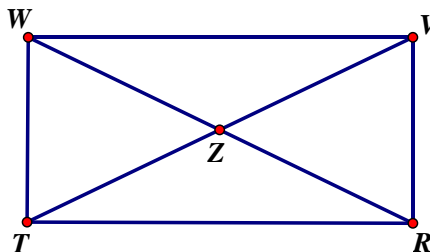   - A. x = 6, y = 23
   - B. x = 13, y = 25
   - C. x = 15, y = 15
   - D. x = 15, y = 27
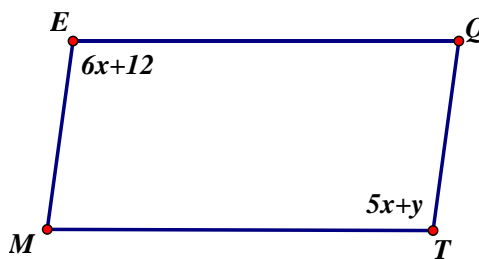
3.   SRPQ is a parallelogram. Determine whether SRPQ is a rhombus. Justify your response.
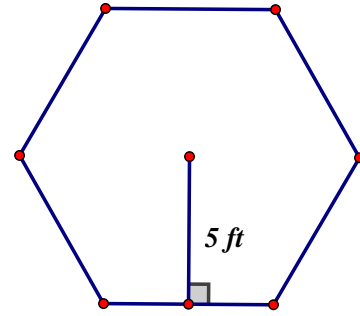

4.   VWTR is a rectangle. WT=12, WZ=14.
       Determine the length of VT.

5.   The measures of four exterior angles of a pentagon are 88°, 88°, 32°, and 90° . Find the measure of the 5th exterior angle of the pentagon.

6. Find the area of a regular hexagon with apothem length 5 ft.
    Answer to the nearest tenth of a square foot.

5 ft

7. Quadrilateral TVWX has the following angle measures: $m\angle T = 70°, m\angle V = 110°, m\angle W = 125°$
    .

    - Find the measure of $\angle X$.
    - What type of quadrilateral is TVWX?

   Measure of $\angle X$ _____ Type of quadrilateral:_____

8. The coordinates of $\triangle GFH$ are G(-1, -1), F(-5, 5), H(7, 5).
    - $\overline{HJ}$ is a median of the triangle. Find the coordinates of J.
    - $\overline{GK}$ is an altitude of the triangle. Find the coordinates of K.
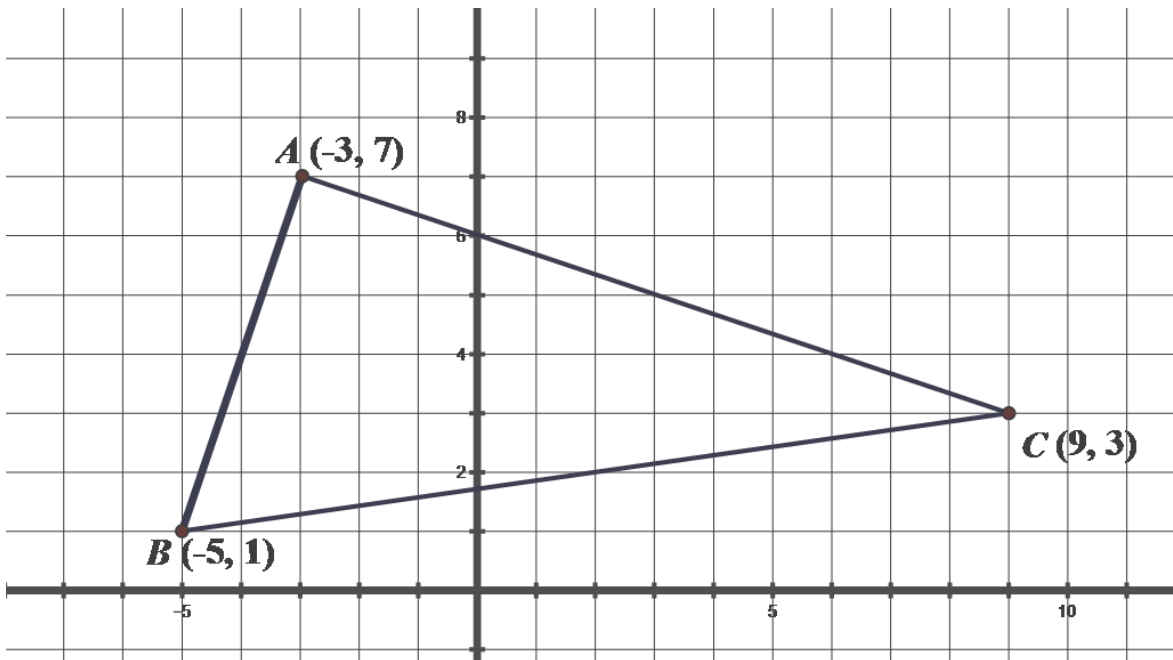   You may use the grid to help you determine the solution.
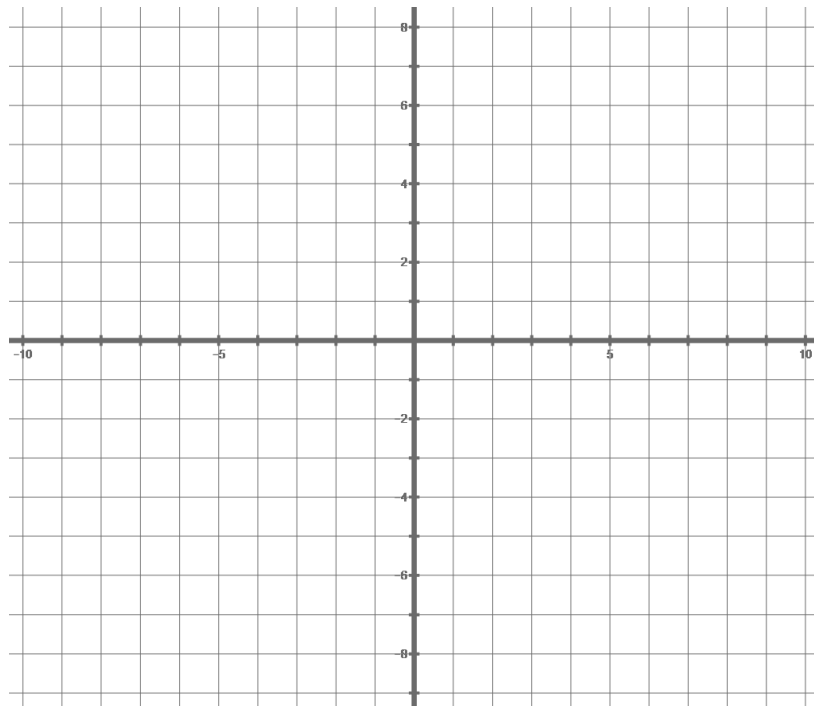
    Coordinates of J _____ Coordinates of K_____

9. A parallelogram has vertices at points R(-5, 2), E(-2, -2), Q(4, 4), and T. Find two possible locations of point T.
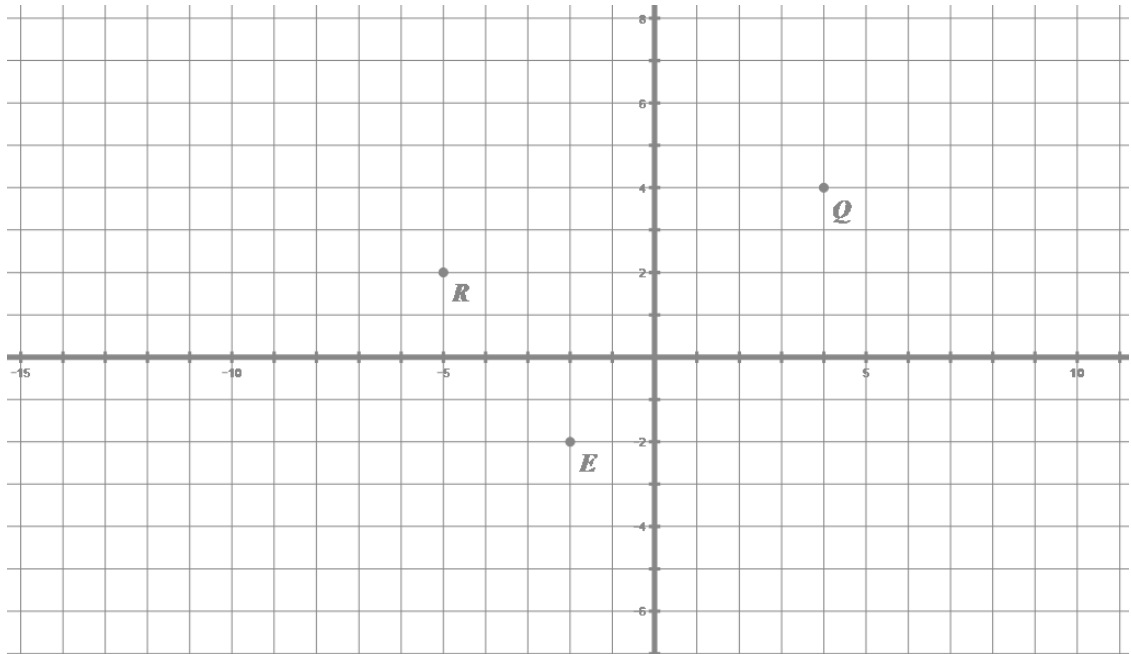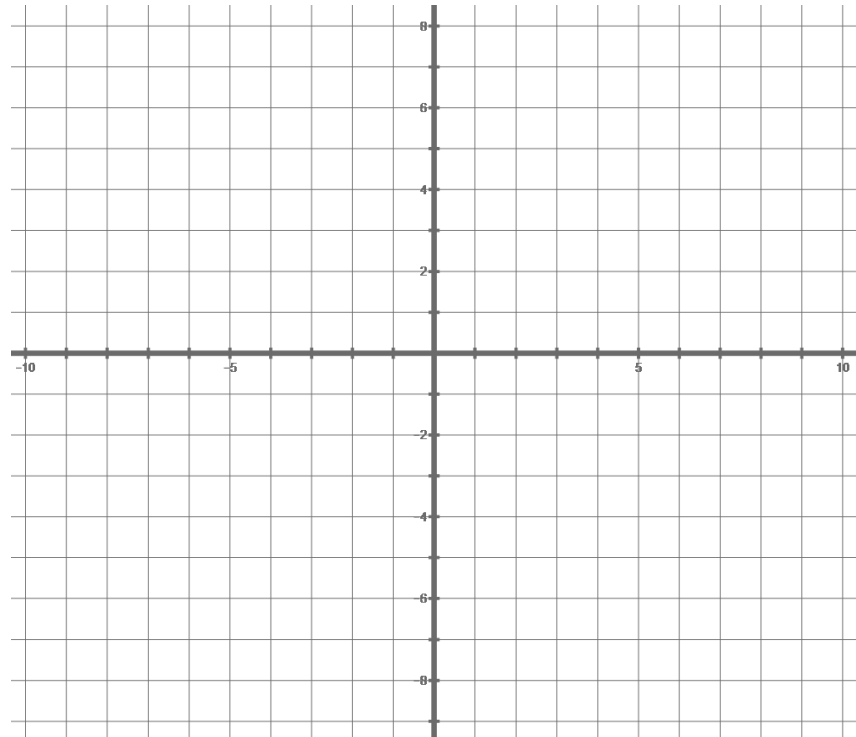

Point T: (_____,_____) or (_____,_____)

10. Find the center of a circle that is circumscribed about $\triangle ABC$.

Coordinates of the center are:_____

11.   Three vertices of a rectangle have coordinates at (-4, 1), (-1, -3), (7, 3).   The diagonals
        intersect at point P. Find the coordinates of P. You may use the grid to help you determine
        the solution.

        The coordinates of P are _____

12.   △XZR is an equilateral triangle.   Determine the coordinates of R to the nearest tenth of a unit,
        if R is in the first quadrant.
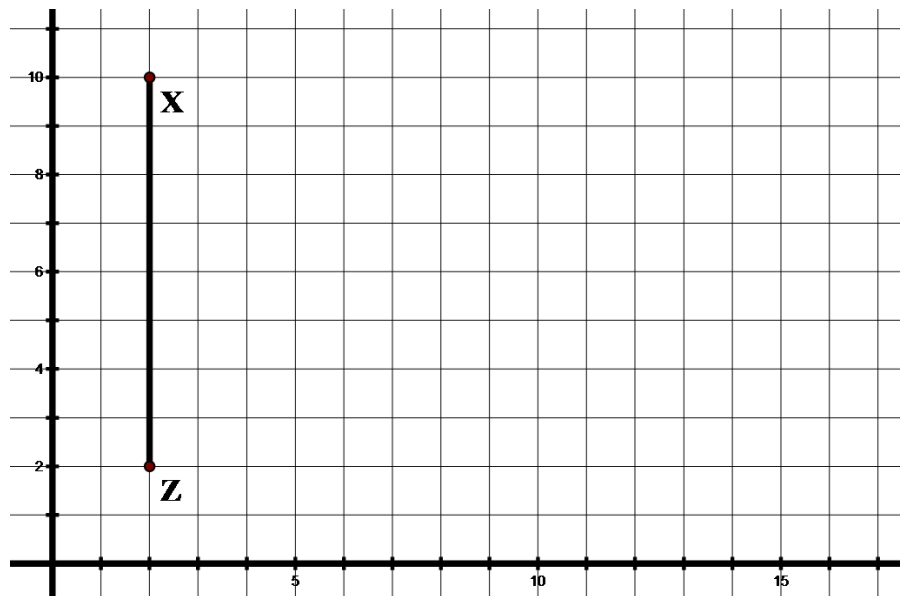
        Coordinates of R:_____

13.   In February 2011, the population of the United States was 3×10^8, precise to one digit. The table below gives the population in India, by decade, from 1901 to 2001. Determine all the years from the table, in which India's population was 3×10^8, precise to one digit.

Population Size and Growth, India, 1901–2001

year	Population
1901	238,396,327
1911	252,093,390
1921	251,321,213
1931	278,977,238
1941	318,660,580
1951	361,088,090
1961	439,234,771
1971	548,159,652
1981	683,329,097
1991	846,421,039
2001	1,028,737,436

Source: Registrar General and Census Commissioner, India, Census of India 2001

14.   A box has a volume of 2.5 cubic meters. Find the volume of the box to the nearest cubic foot.
              1 meter = 3.28 feet

Volume:_____

15.   A hexagon is created by putting a square on each side of an equilateral triangle, and then placing line segments connecting the outside vertices of the squares.
          Is the hexagon equilateral? Justify your answer.
          Is the hexagon equiangular? Justify your answer.

16.   Brady has a storage box that is 5 feet long, 3 feet wide, and 3 feet tall. The box is in a closet that is 6 ft. deep and 6 ft. wide, and 6 ft. tall. Brady wants to tip the box onto its square end. Determine whether he will be able to tip the box without removing it from the closet. Justify your answer.