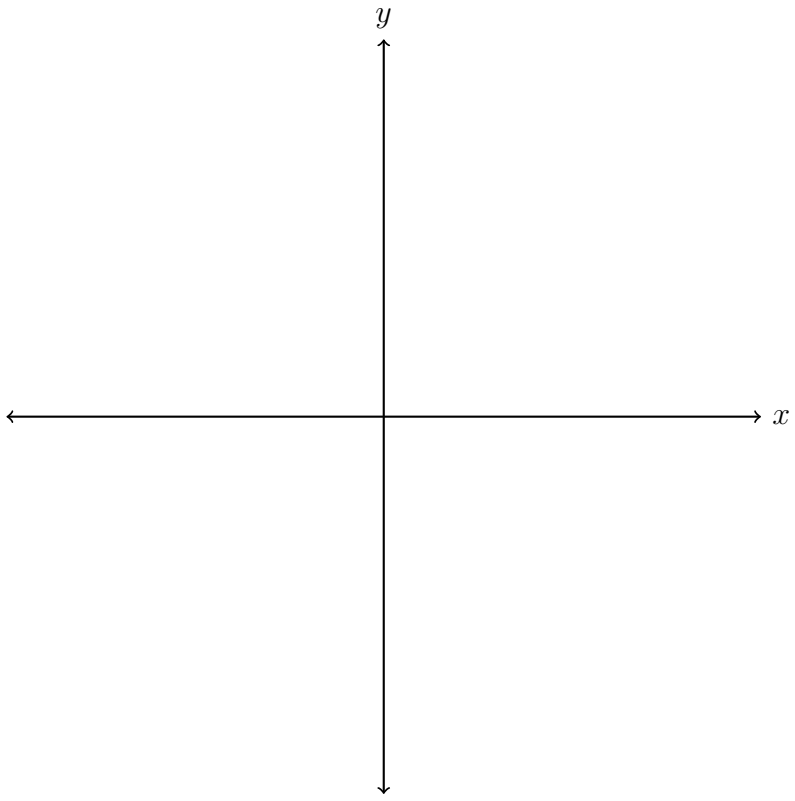
Regents problems August 2019

Sketch the situation on the axes. Mark important values. Do NOT solve!

1. The line represented by $2y = x + 8$ is dilated by a scale factor of k centered at the origin, such that the image of the line has an equation of $y - \frac{1}{2}x = 2$. What is the scale factor?



Vocabulary situations: show circle with parts

2. Given the circle, points, and line segments depicted below, circle whether each statement is true or false. (Circle with chords, secant, radius, diameter, arc, center, circumference, semicircle, tangent, perpendicular situations)

3. Triangle vocabulary: vertex, side, hypotenuse, acute, obtuse, perpendicular, median, altitude, perpendicular bisector

4. Situations with right triangle hypotenuses as circle radii.

5. Use the tangent function to determine the measure of the central angle θ.

6. A regular pentagon is inscribed in a circle as shown below. What is the measure of the central angle between two consecutive vertices, $m\angle AOB$?

Area and volume formula applications

7. Formulas for the area and circumference of circles:
   $A = \pi r^2$
   $C = \pi D = 2\pi r$

8. Find the area of a circle with radius 4 cm.

9. Find the radius of a circle having an area of 25π.

Equation of a circle algebra competencies

10. Expand each binomial-squared expression to the form $ax^2 + bx + c$.

    (a) $(x + 3)^2$

    (b) $(x + 2)^2$

    (c) $(x + 5)^2$

    (d) $(x + 7)^2$

11. Factor each trinomial as a binomial squared.

    (a) $x^2 + 2x + 1$

    (b) $x^2 + 8x + 16$

    (c) $x^2 + 12x + 36$

    (d) $x^2 + 16x + 64$

12. Simplify each radical.

    (a) $\sqrt{50}$

    (b) $\sqrt{18}$

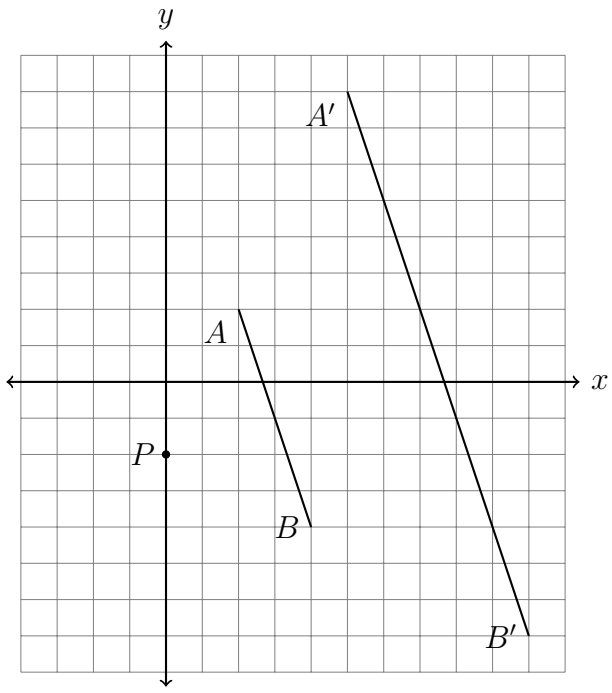
    (c) $\sqrt{27}$

    (d) $\sqrt{24}$

13. What are the coordinates of the center and the length of the radius of the circle whose equation is $x^2 + y^2 = 8x - 6y + 39$?

14. On the set of axes below, $\overline{AB}$ is dilated with a scale factor of $\frac{5}{2}$ centered at point P.

    Which of the following is/are true:



    (a) T F $\overline{AP} \cong \overline{AA'}$

    (b) T F $\overline{AB} \parallel \overline{A'B'}$

    (c) T F $AB = A'B'$

    (d) T F $\frac{5}{2}(A'B') = AB$

15. The coordinates of the vertices of parallelogram $CDEH$ are $C(-5, 5)$, $D(2, 5)$, $E(-1, -1)$, and $H(-8, -1)$. What are the coordinates of P, the point of intersection of diagonals $\overline{CE}$ and $\overline{DH}$?

    (scaffold to graph on exam stationary)