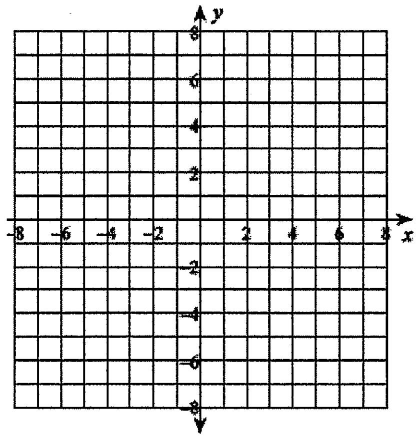
Geometry   Circles, Slope of Lines, Line Segment Partitions Review #1   Name: ________________

Equation of Circle: $(x-h)^2 + (y-k)^2 = r^2$

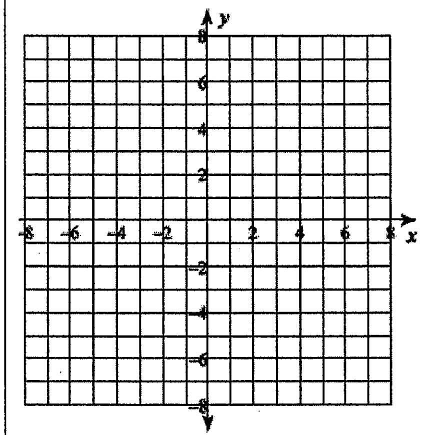
1. Identify the center and the radius of the circle. Then sketch the graph

$(x-2)^2 + (y-4)^2 = 1$



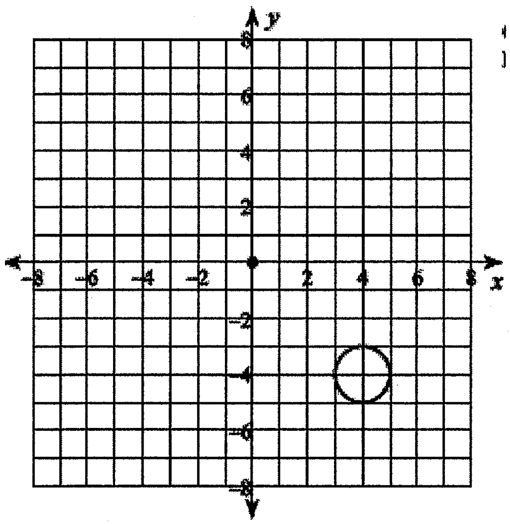
Center: __________ Radius ________

$(x-3)^2 + (y-3)^2 = 4$



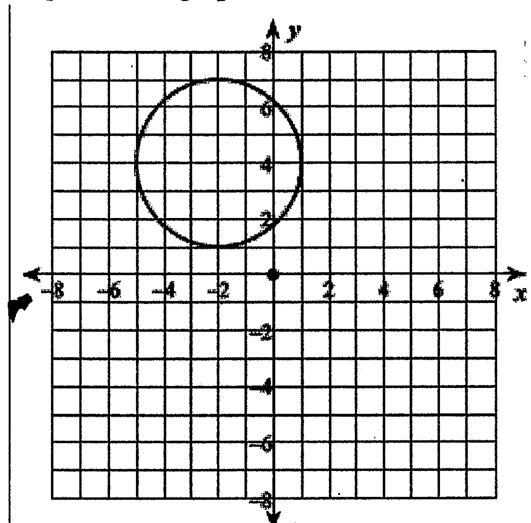
Center: __________ Radius ________

2. Write the equation of the circle in standard form, given the graph below:



Center _____________ Radius: _______

Circle Equation: ______________________



Center _____________ Radius: _______

Circle Equation: ______________________

3. Write the equation of the circle in standard form given that center: (4, -8) Radius: 3

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4. The equation of the circle is $(x-1)^2 + (y+5)^2 = 25$. Tell whether each point is on the circle, in the interior of the circle, or in the exterior of the circle:

   a) (1, 0)

   b) (-3, -1)

5. Write the below equation in standard form. Then identify the center and the radius of the circle:
$$x^2 + y^2 - 24x - 16y + 204 = 0$$

Standard form:

____

Center: __________

Radius: ______

Write the standard form of the equation of the line described.

Steps: **1)** find slope of the given line **2)** plug in point and slope into slope-intercept form, **y = mx+b** and solve for b **3)** Write final equation in slope-intercept form ($y = mx + b$). Leave x and y as variables, replacing only **m** and **b**

6. through: (-2, 10), perpendicular to $y = 3x - 3$

7. through: (1, -5), parallel to $y = -\frac{1}{5}x - 2$

Partitioning Line Segments

Steps: **1)** rewrite ratio as a fraction **2)** Label points and find Δx ($x_2 - x_1$) and Δy ($y_2 - y_1$) **3)** Find location of new ordered pair: X-coordinate: $\boldsymbol{ratio} \times \Delta x + x_1$ Y-coordinate: $\boldsymbol{ratio} \times \Delta y + y_1$

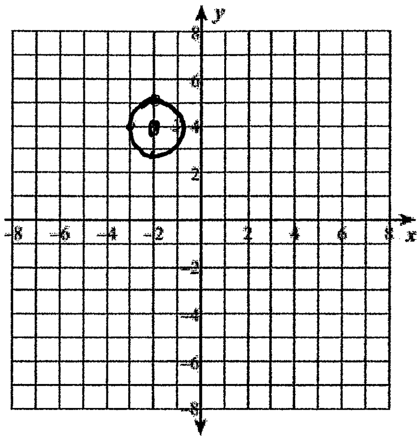
8. Given the points A(-2, 4) and B(7, -2), find the coordinates of the point P on directed line segment $\overline{AB}$ that partitions $\overline{AB}$ in the ratio 1:2.

9. Find the coordinates of point P that lies on the line segment $\overline{MQ}$, M(-9, -5), Q(3, 5), and partitions the segment at a ratio of 2 to 5

Geometry   Circles, Slope of Lines, Line Segment Partitions Review #1   Name: Key

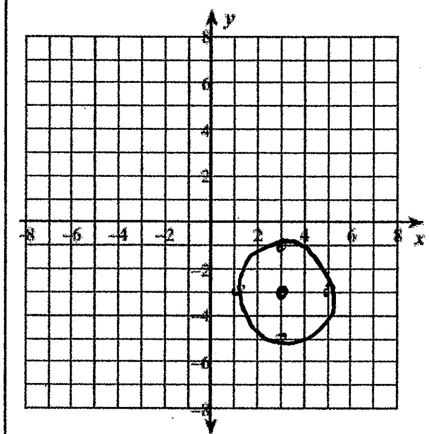
1. Identify the center and the radius of the circle. Then sketch the graph

$(x+2)^2+(y-4)^2=1$ C: (-2, 4)



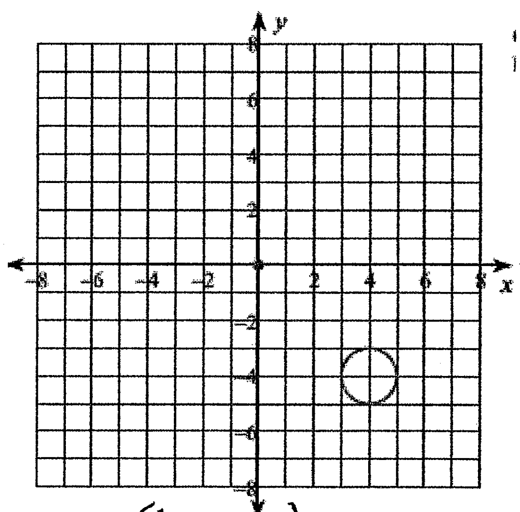
Center: (-2, 4) Radius: 1

$(x-3)^2+(y+3)^2=4$



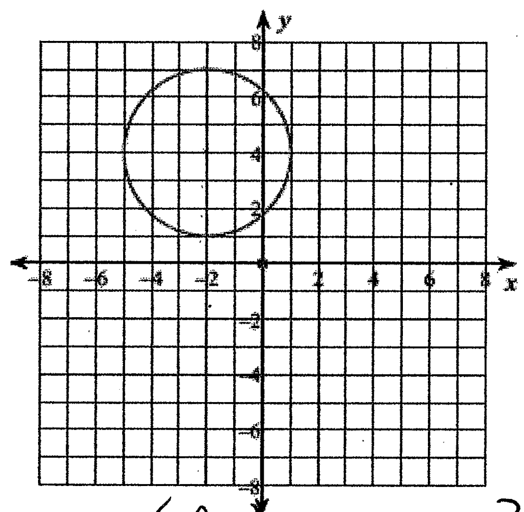
Center: (3, -3) Radius: 2

2. Write the equation of the circle in standard form, given the graph below:



Center: (4, -4) Radius: 1

Circle Equation: $(x-4)^2+(y+4)^2=1$



Center: (-2, 4) Radius: 3

Circle Equation: $(x+2)^2+(y-4)^2=9$

3. Write the equation of the circle in standard form given that center: (4, -8) Radius: 3

$$(x-4)^2+(y+8)^2=9$$

4. The equation of the circle is $(x-1)^2+(y+5)^2=25$. Tell whether each point is on the circle, in the interior of the circle, or in the exterior of the circle:

a) (1, 0)

$(1-1)^2+(0+5)^2=25$ ✓

on the circle

b) (-3, -1)

$(-3-1)^2+(-1+5)^2$

$4^2+4^2=32>25$

outside circle

5. Write the below equation in standard form. Then identify the center and the radius of the circle:

$x^2 + y^2 - 24x - 16y + 204 = 0$

$x^2 - 24x + \underline{144} + y^2 - 16y + \underline{64} = -204 + \underline{144} + \underline{64}$

$(x-12)^2 + (y-8)^2 = 4$

Standard form: $(x-12)^2+(y-8)^2=4$

Center: $(12, 8)$ Radius: 2

Write the standard form of the equation of the line described.

6. through: (-2, 10), perpendicular to $y = 3x - 3$ $m_1 = 3$ $m_2 = -\frac{1}{3}$

$y = mx + b$

$10 = -\frac{1}{3}(-2) + b$

$10 = \frac{2}{3} + b$

$\frac{28}{3} = b$

$\boxed{y = 3x + \frac{28}{3}}$

7. through: (1, -5), parallel to $y = -\frac{1}{5}x - 2$ $m_1 = -\frac{1}{5}$

$y = mx + b$

$-5 = -\frac{1}{5}(1) + b$

$b = -\frac{24}{5}$

$\boxed{y = -\frac{1}{5}x - \frac{24}{5}}$

8. Given the points A(-2, 4) and B(7, -2), find the coordinates of the point P on directed line segment $\overline{AB}$ that partitions $\overline{AB}$ in the ratio 1:2. ratio $= \frac{1}{3}$

$\Delta x = 7-(-2) = 9$

$\Delta y = -2 - 4 = -6$

x-coord: $\frac{1}{3}(9) + -2 = 1$

y-coord: $\frac{1}{3}(-6) + 4 = 2$

$\boxed{P(1, 2)}$

9. Find the coordinates of point P that lies on the line segment $\overline{MQ}$, M(-9, -5), Q(3, 5), and partitions the segment at a ratio of 2 to 5 ratio $= \frac{2}{7}$

$\Delta x = 3 - (-9) = 12$

$\Delta y = 5 - (-5) = 10$

x-coord: $\frac{2}{7}(12) - 9 = \frac{-39}{7}$

y-coord: $\frac{2}{7}(10) - 5 = \frac{-15}{7}$

$\boxed{P\left(-\frac{39}{7}, -\frac{15}{7}\right)}$