2.4 day 2 homework

Use the information provided to write the standard form equation of each circle. Name the center and radius.

1) \( x^2 + y^2 + 16x + 12y + 51 = 0 \)
   \[
   (x + 8)^2 + (y + 6)^2 = 49
   \]
   
   Center: \((-8, -6)\)
   
   \( (8, -6) \ R = 7 \)

2) \( x^2 + y^2 - 4x - 32y + 256 = 0 \)
   \[
   (x - 2)^2 + (y - 16)^2 = 4
   \]
   
   Center: \((2, 16)\)
   
   \( (2, 16) \ R = 2 \)

3) Center: \((4, 5)\)
   Point on Circle: \((-8, 7)\)
   \[
   (x - 4)^2 + (y - 5)^2 = 148
   \]
   
   \[ (x - 4)^2 + (y - 5)^2 = 148 \]

4) Center: \((1, 9)\)
   Tangent to \( x = 7 \)
   \[
   (x - 1)^2 + (y - 9)^2 = 36
   \]
   
   Center: \((1, 9)\)
   
   \[ (x - 1)^2 + (y - 9)^2 = 36 \]

5) Ends of a diameter: \((-10, 11)\) and \((-8, -9)\)
   Area: \(127\pi \)
   \[
   (x + 9)^2 + (y - 1)^2 = 101
   \]
   
   Center: \((-9, 1)\)
   
   \[ (x + 9)^2 + (y - 1)^2 = 101 \]

6) Center: \((-5, 7)\)
   \[
   (x + 5)^2 + (y - 7)^2 = 127
   \]
   
   Center: \((-5, 7)\)
   
   \[ (x + 5)^2 + (y - 7)^2 = 127 \]

7) Center: \((7, 15)\)
   Circumference: \(2\pi \)
   \[
   (x - 7)^2 + (y - 15)^2 = 1
   \]
   
   Center: \((7, 15)\)
   
   \[ (x - 7)^2 + (y - 15)^2 = 1 \]

Section 2.5: Complete the following linear word problems. Make sure you complete all parts!

8) A truck rental company rents a moving truck for one day by charging \$29 plus \$0.20 per mile. Write a linear equation that relates the cost \( C \), in dollars, of renting the truck to the number \( x \) of miles driven. What is the cost of renting the truck if the truck is driven 110 miles? 230 miles?
   \[
   C = 0.20x + 29 \quad 110 \text{ miles} = \$51 \quad 230 \text{ miles} = \$75
   \]

9) Dan receives \$375 per week for selling new and used cars at a car dealership in Oak Lawn, Colorado. In addition, he receives 5% of the profit on any sales that he generates. Write a linear equation that relates Dan's weekly salary \( S \) when he has sales that generate a profit of \( x \) dollars. How much money in sales would he have to sell to earn \$500 a week? Dan sold a car that was worth \$3500. How much money would he make off of that sale (not including the weekly payment of \$375)?
   \[
   S = 0.05x + 375 \quad x = \$2500 \quad S = \$275
   \]

10) Excel supplies electricity to residential customers for a monthly customer charge of \$7.58 plus \$0.08275 cents per kilowatt-hour for up to \( 400 \) kilowatt-hours.
   a. Write a linear equation that relates the monthly charge \( C \), in dollars, to the number \( x \) of kilowatt-hours used in a month.
   b. What is the monthly charge for using 100 kilowatt hours?
   c. What is the monthly charge for using 300 kilowatt hours?
   d. Interpret the slope of the line.
   \[
   a) \ y = 0.08275x + 7.58 \quad b) \$15.86 \quad c) \$32.41 \quad d) \text{ for each usage increase of 1 kilowatt hour, the price increases by 0.08275}
   \]

11) You are buying a house for \$200,000. The interest rate is at an all-time low of 3.5% for a 30 year loan.
   a. What are your monthly payments going to be?
   b. Calculate the interest paid.
   \[ p = \$1392.99 \quad \text{interest} = \$121,476.4 \]

Identify the center and radius of each. Then sketch the graph.

12) \( x^2 + y^2 - 2x + 6y - 6 = 0 \)
   Center: \((1, -3)\)
   Radius: \(5\)

13) \( x^2 + y^2 + 4x - 2y - 4 = 0 \)
   Center: \((-2, 1)\)
   Radius: \(3\)