Find the center and radius.

C. \(x^2 + y^2 + 8x - 6y = -24\)
\((x^2+8x)+(y^2-6y) = -24\)
\((\frac{x}{2})^2 = \frac{16}{4}, (\frac{y}{2})^2 = \frac{9}{2} = 3^2 = 9\)
\((x+4)^2 - 16 + (y-3)^2 - 9 = -24\)
\((x+4)^2 + (y-3)^2 = -24 + 16 + 9 = -24 + 25 = 1\)
\((x-(-4))^2 + (y-3)^2 = 1^2\)
Answer: center \((-4,3)\), radius \(1\)

Find the x-intercept(s) and y-intercept(s). Write “none” if there are none. You don’t need to draw the graphs.

H. \(y = x^2 + 3x + 2\)
\(x\)-intercepts (set \(y = 0\):
\(0 = x^2 + 3x + 2\)
\((x+2)(x+1) = 0\)
Answer: \(x\) intercepts are: \(x = -2, -1\)
\(y\)-intercepts (set \(x = 0\):
\(y = 2\)
Answer: \(y\)-intercept is: \(y = 2\)

I. \(y = x^2 + x - 1\)
\(x\)-intercepts (set \(y = 0\):
\(0 = x^2 + x - 1\)
\(x^2 + x - 1 = 0\) Doesn't factor, use the quadratic formula.
\(x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{-1 \pm \sqrt{1^2-4(1)(-1)}}{2(1)} = \frac{-1 \pm \sqrt{5}}{2}\)
Answer: \(x\) intercepts are: \(x = \frac{-1 \pm \sqrt{5}}{2}\)
\(y\)-intercepts (set \(x = 0\):
\(y = -1\)
Answer: \(y\)-intercept is: \(y = -1\)

Find the slope of the line through the given points.

J. \((-3,2), (1,-6)\)
Answer: \(m = \frac{y_1-y_2}{x_1-x_2} = \frac{2 - (-6)}{(-3) - 1} = \frac{8}{-4} = -2\)

Write the equations for the lines below in the one of the following forms: \(y=mx+b, y=mx, y=b\) or \(x=a\).

L. \((d)\) Slope \(m = -1, (0,1)\) is on the line.
\(y = mx + b\)
\(y = (-1)x + 1\)
Answer: \(y = -x + 1\)

M. \((-3,-2), (4,-1)\) are on the line.
\(m = \frac{y_1-y_2}{x_1-x_2} = \frac{(-2)-(-1)}{(-3)-4} = \frac{-1}{-7} = \frac{1}{7}\)
\(y-y_1 = m(x-x_1)\)
\(y - (-2) = \frac{1}{7}(x - (-3))\)
\(y + 2 = \frac{1}{7}x + \frac{3}{7}\)
\(y = \frac{1}{7}x + \frac{3}{7} - 2\)
Answer: \(y = \frac{1}{7}x + \frac{11}{7}\)

N. \((c)\) Slope \(m = -4/3, y\)-intercept = 14.
\(y = mx + b\)
Answer: \(y = -\frac{4}{3}x + 14\)