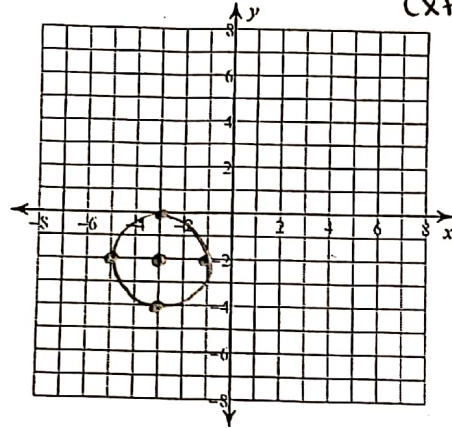


Quiz Review - Circles & Parabolas

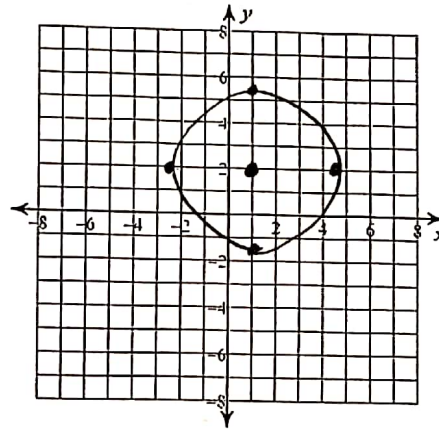
Identify the center and radius of each. Then sketch the graph.

1) $x^2 + 6x = -4y - 9 - y^2$ $x^2 + 6x + 9 + y^2 + 4y + 4 = -9 + 9 + 4$
 $(x+3)^2 + (y+2)^2 = 4$



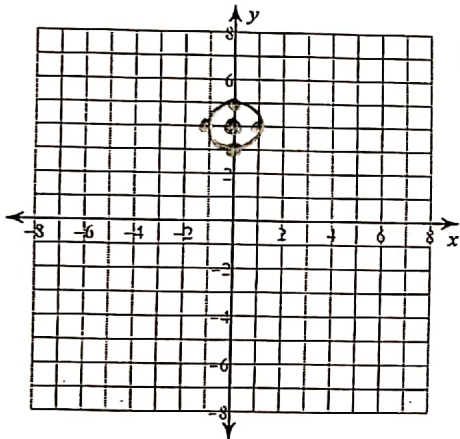
$C: (-3, -2)$
 $r = 2$

2) $x^2 - 4y = 7 - y^2 + 2x$



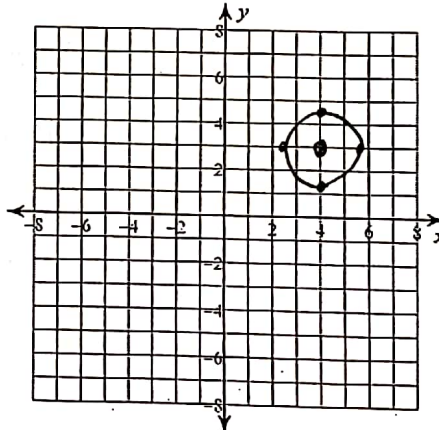
$(x-1)^2 + (y-2)^2 = 12$
 $C: (1, 2)$
 $r = 2\sqrt{3}$

3) $-8y + x^2 = -15 - y^2$ $x^2 + y^2 - 8y + 16 = -15 + 16$



$x^2 + (y-4)^2 = 1$
 $C: (0, 4)$
 $r = 1$

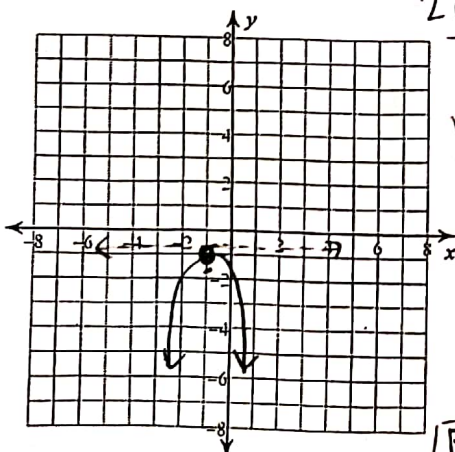
4) $-8x + 22 - 6y + y^2 + x^2 = 0$ $x^2 - 8x + 16 + y^2 - 6y + 9 = -22 + 16 + 9$



$(x-4)^2 + (y-3)^2 = 3$
 $C: (4, 3)$
 $r = \sqrt{3}$

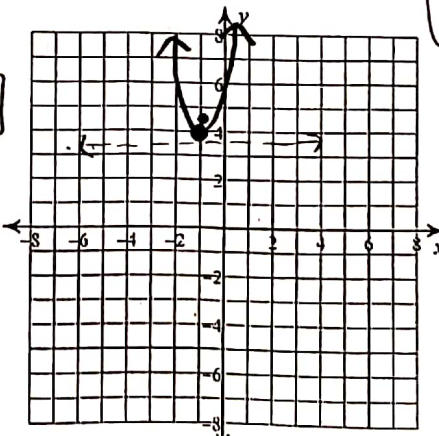
Identify the vertex, axis of symmetry, focus, and directrix of each. Then sketch the graph.

5) $2x^2 + 4x + y + 3 = 0$ $2(x^2 + 2x + 1) = -y - 3 + 2$
 $2(x+1)^2 = -y - 1$



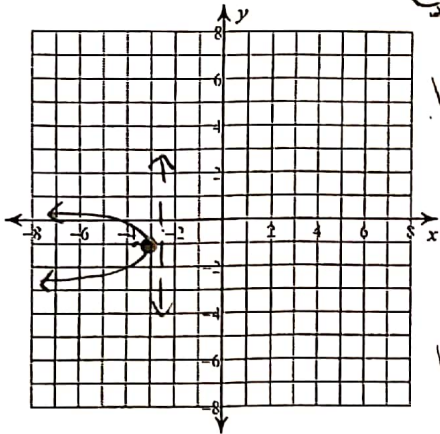
$-2(x+1)^2 = y+1$
 $V: (-1, -1)$
 $-2 = 1/4p$
 $-8p = 1$
 $p = -1/8$
 $F: (-1, -9/8)$
 $D: y = -7/8$
 AOS: $x = -1$

6) $-x^2 - 2x + y - 5 = 0$ $1 + y - 5 = x^2 + 2x + 1$
 $y - 4 = (x+1)^2$



$V: (-1, 4)$
 $1/4p = 1$
 $4p = 1$
 $p = 1/4$
 $F: (-1, 17/4)$
 $D: y = 15/4$
 AOS: $x = -1$

7) $y^2 + x + 2y + 4 = 0$



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

$(y+1)^2 = -x-3$

$-(y+1)^2 = x+3$

$V: (-3, -1)$

$-1 = 1/4p$

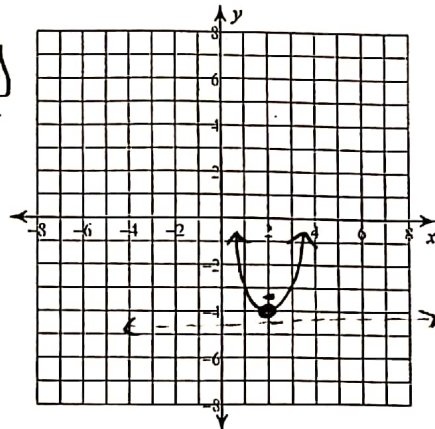
$-4p = 1$
 $p = -1/4$

$F: (-13/4, -1)$

$D: x = -1/4$

$AOS: y = -1$

8) $-x^2 + 4x + 2y + 4 = 0$ $4 + 2y + 4 = x^2 - 4x + 4$
 $2y + 8 = (x-2)^2$



$y+4 = \frac{1}{2}(x-2)^2$

$V: (2, -4)$

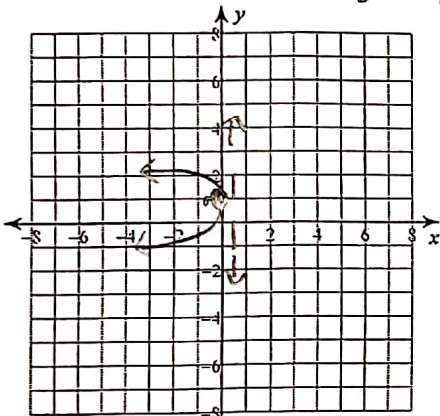
$\frac{1}{2} = 1/4p$
 $4p = 2$
 $p = 1/2$

$F: (2, -3.5)$

$D: y = -4.5$

$AOS: x = 2$

9) $y^2 + x - 2y + 1 = 0$



$F: (-1/4, 1)$

$D: x = 1/4$

$AOS: y = 1$

$y^2 - 2y + 1 = -x - 1 + 1$

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

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

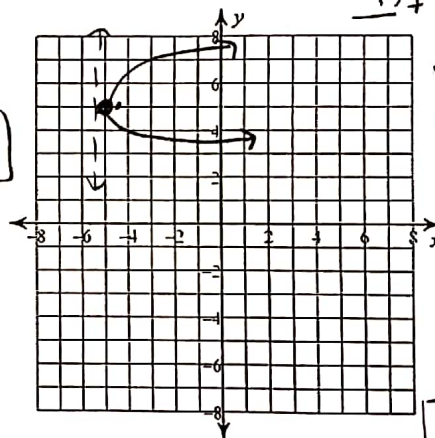
$V: (0, 1)$

$-1 = 1/4p$

$-4p = 1$

$p = -1/4$

10) $-3y^2 + x + 30y - 70 = 0$ $x - 70 = 3y^2 - 30y$
 $75 + x - 70 = 3(y^2 - 10y + 25)$



$x+5 = 3(y-5)^2$

$V: (-5, 5)$

$\frac{1}{4p} = 3$

$12p = 1$

$p = 1/12$

$F: (-59/12, 5)$

$D: x = -61/12$

$AOS: y = 5$

Use the information provided to write the vertex form equation of each parabola.

11) Vertex: $(1, -4)$, Focus: $(\frac{3}{4}, -4)$ $p = F - V = \frac{3}{4} - 1 = -1/4$

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

$\frac{1}{4(-1/4)} = -1$

12) Vertex: $(0, 2)$, Directrix: $y = \frac{57}{28}$

$y-2 = -7x^2$

$p = V - D = 2 - 57/28 = -1/28$
 $\frac{1}{4(-1/28)} = -7$

13) Focus: $(10, \frac{55}{8})$, Directrix: $y = \frac{57}{8}$ $p = \frac{V-D}{2} = \frac{7 - 57/8}{2} = -1/8$

$V: (10, \frac{54/8 + 57/8}{2}) = (10, 7)$

$y-7 = -2(x-10)^2$

$\frac{1}{4(-1/8)} = -2$

14) Focus: $(-\frac{17}{16}, -4)$, Directrix: $x = -\frac{15}{16}$ $p = \frac{V-D}{2} = \frac{-1 - (-15/16)}{2} = -1/16$

$V: (-\frac{17/16 + (-15/16)}{2}, -4) = (-1, -4)$

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

$\frac{1}{4(-1/16)} = -4$