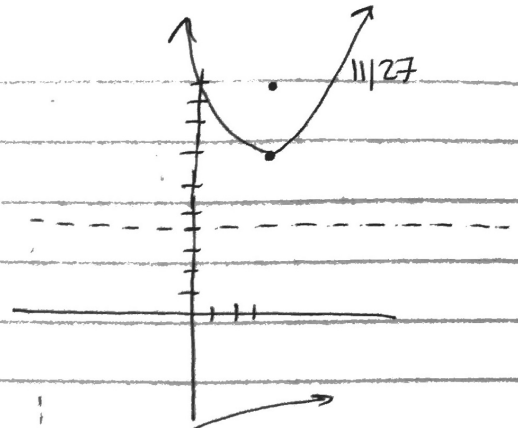
pg. 428
# 1, 3, 11, 13, 15-23 odd

1. $(x-3)^2 = 12(y-7)$ $\quad 12 = 4p$, $3 = p$

vertex: (3, 7) focus: (3, 10)

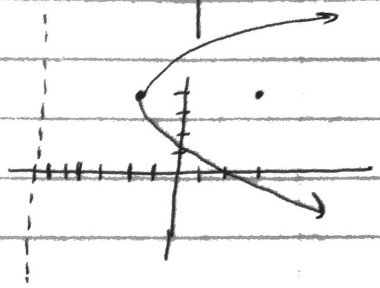
aos: $x = 3$ directrix: $y = 4$




3. $(y-4)^2 = 20(x+2)$ $\quad 20 = 4p$, $5 = p$

vertex: (-2, 4) focus: (3, 4)

aos: $y = 4$ directrix: $x = -7$



11. $x^2 = 8(y-2)$ $\quad 8 = 4p$, $2 = p$

focus: (0, 0)

directrix: $y = -4$ The focus is 4 ft above the directrix (ground)

13. $y^2 - 180x + 10y + 565 = 0$

a. $y^2 + 10y = 180x - 565$

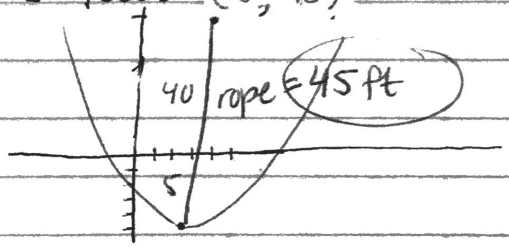
$(y+5)^2 = 180x - 565 + 25$

$(y+5)^2 = 180x - 540$

$(y+5)^2 = 180(x-3)$

vertex: (3, -5)

b. focus: (3, 40) $\quad 4p = 180$, $p = 45$



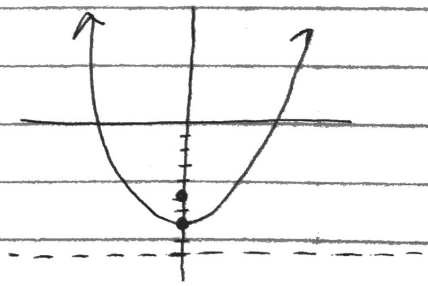

15. $x^2 - 17 = 8y + 39$ $\quad 8 = 4p$, $2 = p$

$x^2 = 8y + 56$

$x^2 = 8(y+7)$

vertex: (0, -7) focus: (0, -5)

aos: $x = 0$ directrix: $y = -9$



17. $3x^2 + 72 = -72y$ $\quad -24 = 4p$, $-6 = p$

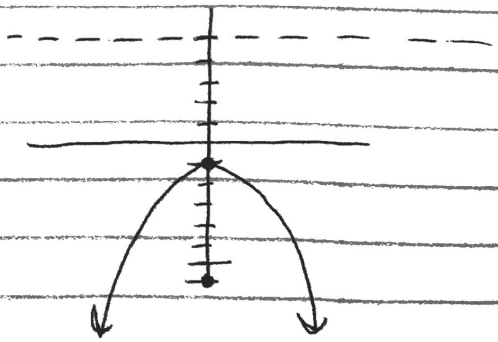
$x^2 + 24 = -24y$

$x^2 = -24y - 24$

$x^2 = -24(y+1)$ focus: (0, -7)

vertex: (0, -1) directrix: $y = 5$

aos: $x = 0$



19. $60x - 80 = 3y^2 + 100$

$60x - 180 = 3y^2$

$20x - 60 = y^2$

$20(x-3) = y^2$

vertex: $(3, 0)$

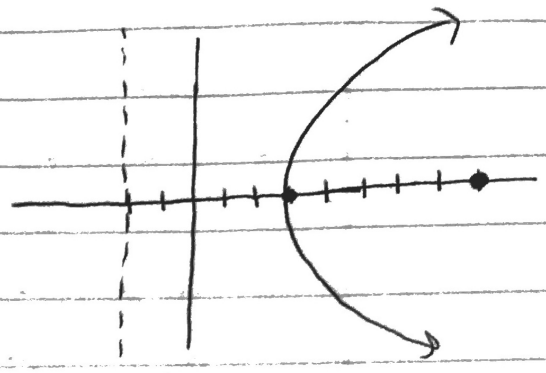
aos: $y = 0$

$20 = 4p$

$5 = p$

focus: $(8, 0)$

directrix: $x = -2$



21. $-72 = 2y^2 - 16y - 20x$

$20x - 72 = 2y^2 - 16y$

$10x - 36 = y^2 - 8y$

$10x - 36 + 16 = (y^2 - 4)^2$

$10x - 20 = (y-4)^2$

$10(x-2) = (y-4)^2$

vertex: $(2, 4)$

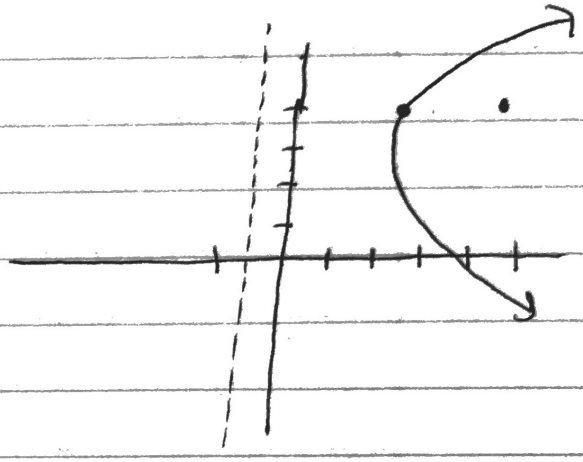
aos: $y = 4$

$10 = 4p$

$2.5 = p$

focus: $(4.5, 4)$

directrix: $x = -0.5$



23. $x^2 - 18y + 12x = 126$

$x^2 + 12x = 18y + 126$

$(x+6)^2 = 18y + 126 + 36$

$(x+6)^2 = 18y + 162$

$(x+6)^2 = 18(y+9)$

vertex: $(-6, -9)$

aos: $x = -6$

$18 = 4p$

$4.5 = p$

focus: $(-6, -4.5)$

directrix: $y = -13.5$