

9.2 Ellipses

9) b 10) a 11) c 12) d

$$14) \frac{x^2}{4} + \frac{y^2}{9/4} = 1$$

$$17) \frac{x^2}{24} + \frac{y^2}{49} = 1$$

$$19) \frac{5x^2}{48} + \frac{y^2}{16} = 1$$

$$21) \frac{(x-2)^2}{4} + \frac{(y+1)^2}{1} = 1$$

$$24) \frac{(x-3)^2}{9} + \frac{(y-5)^2}{16} = 1$$

$$26) \frac{(x-2)^2}{9} + \frac{y^2}{5} = 1$$

31) Center (4, -1)
 V: (4, 4) & (4, -6)
 F: (4, 2) & (4, -4)
 $e = 3/5$

32) C: (-3, 2)
 V: (-3, 6) & (-3, -2)
 CV: (-3 ± 2√3, 2)
 F: (-3, 4) & (-3, 0)
 $e = 1/2$

$$39) \frac{(x+2)^2}{4} + \frac{(y-3)^2}{9} = 1$$

$$a = 3 \quad b = 2 \quad c = \sqrt{5}$$

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

$$F: (-2, 3 \pm \sqrt{5})$$

$$CV: (-4, 3) \text{ & } (0, 3)$$

$$e = \sqrt{5}/3$$

50) V: (0, 8) & (0, -8)

$$h = 0, k = 0$$

$$C: (0, 0) \checkmark$$

$$e = 1/2 = c/a$$

$$\star 1/2 = c/8$$

$$\star c = 4, a = 8, b = ?$$

$$16 = 64 - b^2$$

$$b^2 = 48$$

$$\boxed{\frac{x^2}{48} + \frac{y^2}{64} = 1}$$

$$41) a = 1$$

$$y = \pm 5x - 7 \quad \frac{b}{a} = 5$$

$$c: (0,0)$$

$$\boxed{\frac{x^2}{1} - \frac{y^2}{25} = 1}$$

$$44) c = 10$$

$$c: (0,0)$$

$$y = \pm \frac{3}{4}x$$

$$y = \pm \frac{b}{a} = \frac{3m}{4m}$$

$$c^2 = a^2 + b^2$$

$$100 = (4m)^2 + (3m)^2$$

$$100 = 16m^2 + 9m^2$$

$$100 = 25m^2$$

$$m^2 = 4, m = 2$$

$$\star b = 6, a = 8, c = 10$$

$$\boxed{\frac{x^2}{64} - \frac{y^2}{36} = 1}$$

$$48) v: (3,0)(3,4) \quad a = 2$$

$$y = \frac{a}{m}x, \quad b = 3$$

$$c: (3,2)$$

$$\boxed{\frac{(y-2)^2}{4} - \frac{(x-3)^2}{9} = 1}$$

Pg. 665 - Hyperbolas

7) a 8) d 9) b 10) c ~~11)~~

13) $a = 2$
 $c = 4$
 $b^2 = 12$

$$\frac{(x-4)^2}{4} - \frac{y^2}{12} = 1$$

18) Center (0,1) $a = 2$
 * Plug into formula

$$\frac{(x-0)^2}{4} - \frac{(y-1)^2}{b^2} = 1$$

Point (5,4) \rightarrow plug in

$$\frac{(5-0)^2}{4} - \frac{(4-1)^2}{b^2} = 1$$

$$b^2 = \frac{36}{21} = \frac{12}{7}$$

$$\frac{x^2}{4} - \frac{(y-1)^2}{12/7} = 1$$

27) $\frac{(x-3)^2}{9} - \frac{(y-1)^2}{1} = 1$

C: (3,1)

V: (0,1) & (6,1)

CV: (3,0) (3,2)

f: $(3 \pm \sqrt{10}, 1)$

Asym: $y-1 = \pm \frac{1}{3}(x-3)$

31) a) $\frac{x^2}{9} - \frac{y^2}{4} = 1$

b) C: (0,0) $y = \pm \frac{2}{3}x$

V: $(\pm 3, 0)$

CV: $(0, \pm 2)$

f: $(\pm \sqrt{13}, 0)$

25) $\frac{y^2}{16} - \frac{x^2}{4} = 1$

C: (0,0)

V: (0,4) (0,-4)

CV: (2,0) (-2,0)

f: $(0, \pm 2\sqrt{5})$

Asym: $y = \pm 2x$

37) $\frac{(x+4)^2}{7} - \frac{y^2}{2} = 1$

C: (-4,0)

V: $(-4 \pm \sqrt{7}, 0)$ $y = \pm \frac{\sqrt{14}}{7}(x+4)$

CV: $(-4, \pm \sqrt{2})$

f: (-7,0) (-1,0)

43) e

44) b

45) d

46) f

47) a

48) e

50) $(y-k)^2 = 4P(x-h)$

pt: (-2, 6) v: (0, 0)

$(6-0)^2 = 4P(-2-0)$

$36 = -8P$

$-9/2 = P$

so: $y^2 = 4(-9/2)x$

$y^2 = -18x$

52) F(0, 3) v(0, 0)

so $p = 3$

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

$x^2 = 12y$

61) v: (0, 0)

$1/4P = 1/2$

f (0, 1/2)

$4P = 2$

d: $y = -1/2$

$P = 1/2$

55) d: $y = 4$ v(0, 0)

$P = -4$

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

$x^2 = -16y$

67) $(x+1)^2 = 8(y+2)$

v: (-1, -2)

$4P = 8$

f (-1, 0)

$P = 2$

d: $y = -4$

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

$P = 1$

v: (-1, 2)

f: (0, 2)

d: $x = -2$

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

* pt: (0, 0) plug in

$P = 3/4$

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

89) v: (0, 2)

d: $x = -2$

$P = 2$

$(y-2)^2 = 8x$