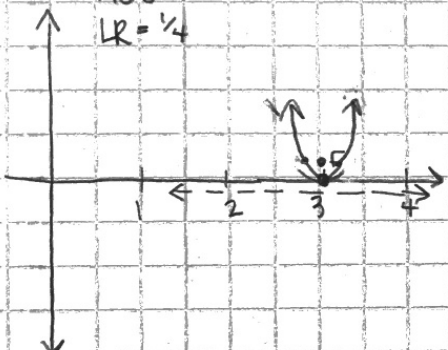


7.11 Conics Review

- $x^2 - 2y^2 = 8$ hyperbola
- $x + \frac{1}{2}y^2 = 4$ parabola
- $x^2 = 8 - 2y^2$ ellipse

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

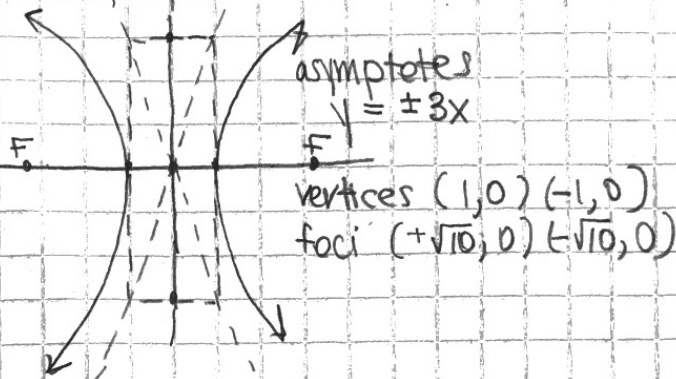
parabola
 $(x-3)^2 = \frac{1}{4}y$
 opens up
 vertex $(3, 0)$
 $4p = \frac{1}{4}$
 $p = \frac{1}{16}$
 focus $(3, \frac{1}{16})$
 directrix $y = -\frac{1}{16}$
 AOS $x = 3$
 LR = $\frac{1}{4}$



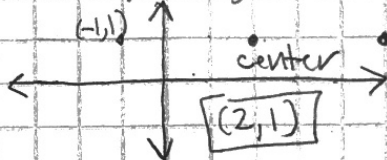
6. $\frac{9x^2}{9} - \frac{y^2}{9} = \frac{9}{9}$
 $x^2 - \frac{y^2}{9} = 1$

hyperbola
 center $(0, 0)$
 $a^2 = 1$ $a = 1$
 $b^2 = 9$ $b = 3$
 $c^2 = 1 + 9 = \sqrt{10} \approx 3.162$

opens L/R

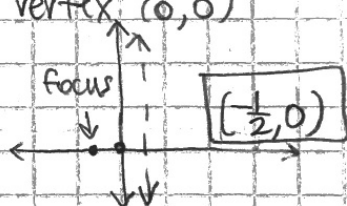


7. foci $(5, 1)$ $(-1, 1)$



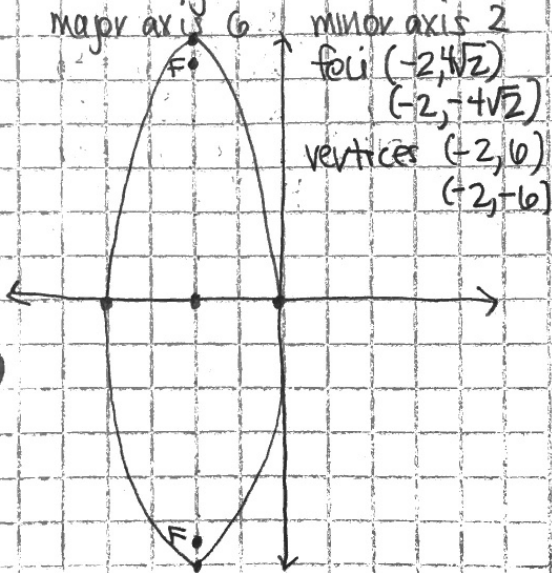
8. $b^2 = 10$
 $b = \sqrt{10}$

9. directrix $x = \frac{1}{2}$
 vertex $(0, 0)$



5. $\frac{(x+2)^2}{4} + \frac{y^2}{36} = 1$

ellipse
 center $(-2, 0)$
 vertical major axis
 major axis 6
 minor axis 2
 $a^2 = 36$ $a = 6$
 $b^2 = 4$ $b = 2$
 $c^2 = 32$ $c = 4\sqrt{2} \approx 5.657$

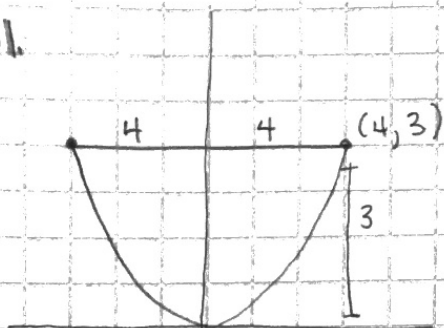


10. $(-13, -2)$ $(-4, -2)$
 midpoint $(\frac{-13 + -4}{2}, \frac{-2 + -2}{2})$

center $(-8.5, -2)$

diameter: $-4 - (-13) = 9$
 radius $\frac{9}{2}$

11.



Find the focus

$$x^2 = 4py$$

$$4^2 = 4p(3)$$

$$\frac{16}{12} = p$$

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

1.33 ft above vertex

13. $4x^2 + y^2 - 8x + 4y + 4 = 0$

$$4x^2 - 8x + y^2 + 4y = -4$$

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

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

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

14. $2x^2 - y^2 + 12x + 2y + 4 = 1$

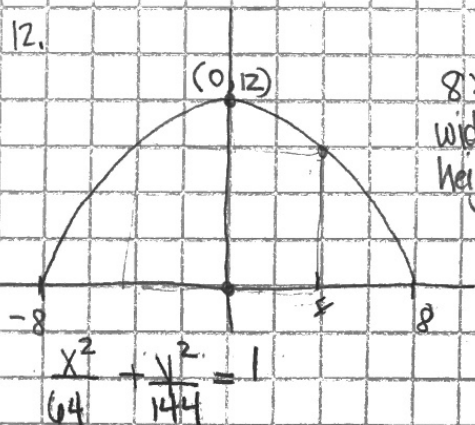
$$2x^2 + 12x - y^2 + 2y = -3$$

$$2(x^2 + 6x + 9) - (y^2 - 2y + 1) = -3 + 18 - 1$$

$$\frac{2(x+3)^2}{14} - \frac{(y-1)^2}{14} = \frac{14}{14}$$

$$\boxed{\frac{(x+3)^2}{7} - \frac{(y-1)^2}{14} = 1}$$

12.



8x10

width of 8

height of 10

$$\frac{x^2}{64} + \frac{y^2}{144} = 1$$

If $x=4$, find y .

$$\frac{4^2}{64} + \frac{y^2}{144} = 1 \Rightarrow \frac{y^2}{144} = \frac{8}{9}$$

$$y^2 = 128$$

$$y = \sqrt{128}$$

$$y \approx 11.314$$

yes, the truck can pass because

$$11.314 > 10$$