

7a)

$$2x^2 = y$$

$$x^2 = \frac{1}{2}y$$

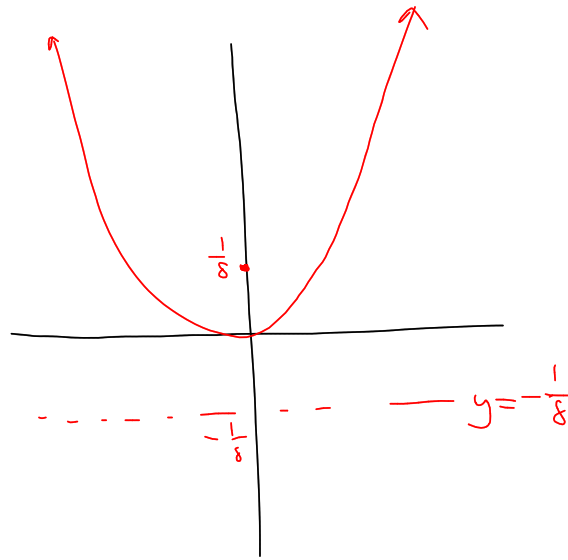
$$4a = \frac{1}{2}$$

$$a = \frac{1}{8}$$

\therefore focus $(0, \frac{1}{8})$

directrix $y = -\frac{1}{8}$

vertex $(0, 0)$

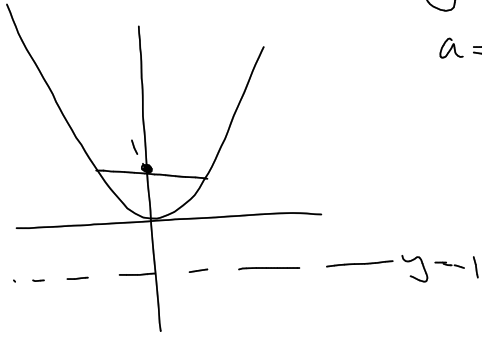


8e) latus rectum, $y=1$

\therefore directrix $y=-1$

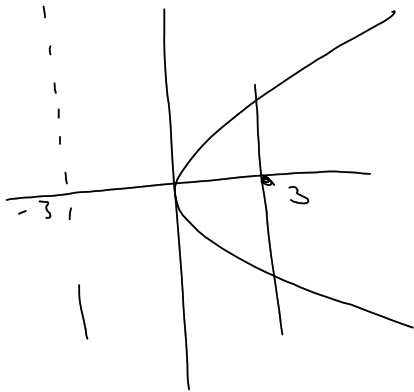
$$a=1$$

$$\therefore \underline{\underline{x^2 = 4y}}$$



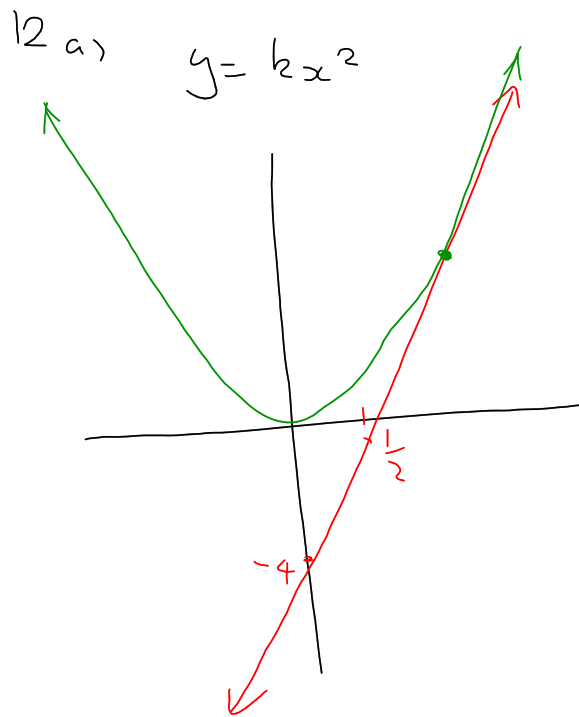
9e) latus rectum $x=3$

directrix $x=-3$



$$a = 3$$

$$\underline{y^2 = 12x}$$



$8x - y - 4 = 0$ is a tangent.

$$y = 8x - 4$$

$$kx^2 = 8x - 4$$

$$kx^2 - 8x + 4 = 0$$

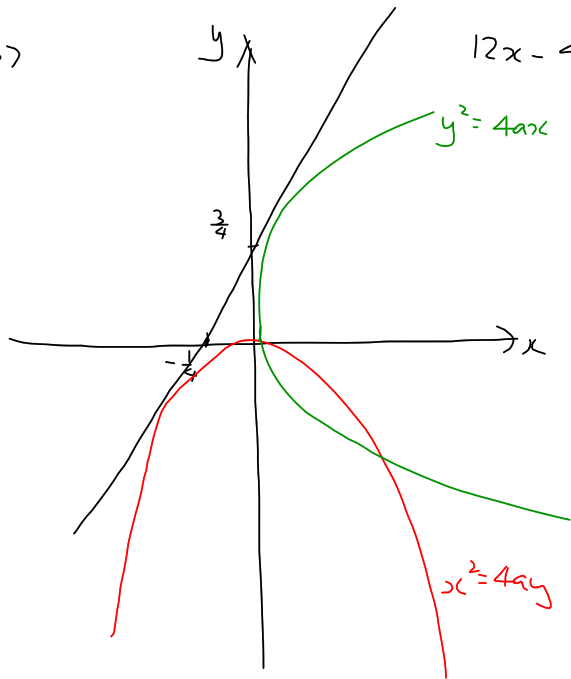
tangent $\therefore \Delta = 0$

$$64 - 16k = 0$$

$$k = 4$$

$$\therefore y = \underline{\underline{4x^2}}$$

12b)



$$12x - 4y + 3 = 0$$

$$y^2 = 4ax$$

$$x^2 = 4a\left(3x + \frac{3}{4}\right)$$
$$x^2 - 12ax - 3a = 0$$

$$\Delta = 0$$

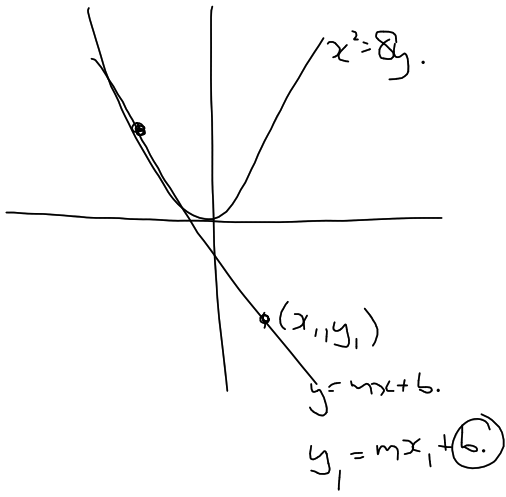
$$144a^2 + 12a = 0$$

$$12a(12a + 1) = 0$$

$$a = 0 \text{ or } a = -\frac{1}{12}$$

not a solution

$$x^2 = -\frac{1}{3}y$$



$$\frac{x^2}{8} = mx + b$$

$$x^2 - 8mx - 8b = 0$$

$$\Delta = 0$$

$$64m^2 + 32b = 0.$$

$$64m^2 - 32x_1m + 32y_1 = 0$$

$$2m^2 - x_1m + y_1 = 0$$