

(10)

$$a) \frac{(3x-2)^2(3x+1)}{9x^3+18x^2-x-2}$$

$$\begin{array}{r} -2 \overline{) 9 \quad 18 \quad -1 \quad -2} \\ \underline{-18 \quad 0 \quad 2} \\ 9 \quad 0 \quad -1 \quad \overline{10} \end{array}$$

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

$$b.) 0 = \frac{(3x-2)^2(3x+1)}{(x+2)(9x^2-1)} = \frac{(3x-2)^2 \cancel{(3x+1)}}{(x+2) \cancel{(3x+1)}(3x-1)}$$

$$0 = \frac{(3x-2)^2}{(x+2)(3x-1)} \quad (3x-2)^2 = 0$$

$$\frac{3x}{3} = \frac{2}{3}$$

$$\boxed{x = \frac{2}{3}}$$

$$\boxed{\left(\frac{2}{3}, 0\right)}$$

$$c) \frac{(3x-2)^2 \cancel{(3x+1)}}{(x+2) \cancel{(3x+1)}(3x-1)}, \text{ where } x=0$$

$$\frac{(3(0)-2)^2}{(2)(-1)} = \frac{(-2)^2}{-2} = \frac{4}{-2} = -2$$

$$\boxed{(0, -2)}$$

d) hole: $3x + 1 = 0$

$$\frac{3x}{3} = \frac{-1}{3} \quad \cancel{\frac{3x}{3} = \frac{-1}{3}}$$

$$\boxed{x = -\frac{1}{3}} \text{ a hole}$$

e). H.A. $\frac{27}{9} = \boxed{3}$ $y=3$ is a horizontal asymptote

f) $x = -2$

$$\sqrt{x} = \sqrt{\frac{1}{9}} = -\frac{1}{3}, \frac{1}{3} \quad x = -2, -\frac{1}{3}, \frac{1}{3} \text{ are vertical asymptotes}$$