

$$1. f(x) = \frac{3x+15}{x^2+3x-10}$$

$$= \frac{3(x+5)}{(x+5)(x-2)}$$

Hole $x+5=0$ Asym $x-2=0$
 $x=-5$ $x=2$

$$3. f(x) = \frac{x^2-5x-6}{2x-6}$$

$$= \frac{(x+1)(x-6)}{2(x-3)}$$

Asym $x-3=0$ ~~2~~
 $x=3$

$$7. (c^2+2c-8)(c^2-16)^{-1}$$

$$\frac{c^2+2c-8}{c^2-16}$$

$$\frac{\cancel{(c+4)}(c-2)}{\cancel{(c+4)}(c-4)}$$

$$\frac{c-2}{c-4}$$

$$8. \frac{x^2+3x+2}{x-3} \cdot \frac{x^2-9}{x+1}$$

$$\frac{(x+2)\cancel{(x+1)}\cancel{(x-3)}(x+3)}{\cancel{(x-3)}\cancel{(x+1)}}$$

$$(x+2)(x+3)$$

$$x^2+3x+2x+6$$

$$\boxed{x^2+5x+6}$$

$$9. \frac{m^2}{n^3} \cdot \frac{n}{m^4} \div \frac{1}{mn}$$

$$\frac{m^2}{n^3} \cdot \frac{n}{m^4} \cdot \frac{mn}{1}$$

$$\frac{m^3 n^2}{m^4 n^3} = \boxed{\frac{1}{mn}}$$