

DIRECTIONS: Find (a) the domain of each function and (b) its zeros, if any.

$$1. g(x) = \frac{x^3+2x}{x^2-4}$$

Domain:  $x \neq \pm 2$   
Zeros:  $x = 0$

$$2. f(m) = (y^3 - 8)(y + 2)^{-3}$$

Domain:  $y \neq -2$   
Zeros:  $y = 2$

$$3. g(y) = \frac{4y^2+15y-4}{(2y-1)^2}$$

Domain:  $y \neq \frac{1}{2}$   
Zeros:  $y = -4, \frac{1}{4}$

$$4. h(t) = \frac{t^3+4t^2-t-4}{t^3-t^2+t-1}$$

Domain:  $t \neq 1$   
Zeros:  $t = -4, -1$   
(+1 isn't allowed because of the Domain rules)

DIRECTIONS: Simplify.

$$5. \frac{t^4-1}{t^3+t^2+t+1}$$

$t - 1$

$$6. \frac{x^3-x^2y+xy^2-y^3}{x^4-y^4}$$

$\frac{1}{x+y}$

$$7. \frac{u^4-v^4}{u^4+2u^2v^2+v^4}$$

$\frac{(u+v)(u-v)}{u^2+v^2}$

$$8. \frac{ax-ay+by-bx}{ax-ay-by+bx}$$

$\frac{a-b}{a+b}$

$$9. \frac{3x^3}{12x^2+9x}$$

$\frac{x^2}{4x+3}$

$$10. \frac{x^2-3x+2}{x^2+5x-6}$$

$\frac{x-2}{x+6}$

$$11. \frac{x^2-2x-3}{x^2-7x+12}$$

$\frac{x+1}{x-4}$