

Power Point

**PRECALCULUS**

Domain and Range Worksheet

Name: Mr. Key

For each of the following functions, determine the domain algebraically (and confirm graphically), and determine the range graphically.

1)  $f(x) = 3x^2 - 6$

$D: (-\infty, \infty)$

$R: (-\infty, \infty)$

2)  $g(x) = \frac{1}{x-1}$

$D: (-\infty, 1) \cup (1, \infty)$

$R: (-\infty, 0) \cup (0, \infty)$

HA:  $y = 0$

VA:  $x = 1$

3)  $h(x) = \sqrt{3-x}$

$D: (-\infty, 3]$

$R: [0, \infty)$

No Asymptotes

4)  $j(x) = \frac{\sqrt{x}}{x-4}$   $x \neq 4$   $x \geq 0$

$D: [0, 4) \cup (4, \infty)$

$R:$

HA:  $y = 0$

VA:  $x = 4$

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

$D: (-\infty, 1) \cup (1, \infty)$

$R:$

HA None

~~VA~~ Hole:  $x = 1, y = 1$

$$5) k(x) = \frac{x^2 - 3x + 6}{x^2 - 3x - 10}$$

$$= \frac{(x-1)(x+1)}{(x-5)(x+2)}$$

$$D^{\circ}: (-\infty, -2) \cup (-2, 5) \cup (5, \infty)$$

$$R^{\circ}$$

$$VA^{\circ}: x = 5, -2$$

$$HA^{\circ}: y = 1$$

$$6) m(x) = \frac{2x}{\sqrt{x^2 - 9}}$$

$$x^2 - 9 > 0$$

$$x > 3 \quad x < -3$$

$$D^{\circ}: (-\infty, -3) \cup (3, \infty)$$

$$R^{\circ}$$

$$HA^{\circ}: y = 2$$

$$VA^{\circ}: x = 3, -3$$

$$7) n(x) = \sqrt{8x^3 - 24x^2}$$

$$8x^3 - 24x^2 \geq 0$$

$$8x^2(x-3) \geq 0$$

$$x=0 \quad x \geq 3$$

$$D^{\circ}: [3, \infty)$$

$$8) p(x) = \frac{\sqrt{x-3}}{\sqrt{x+4}}$$

$$x \geq 3 \quad x > -4$$

$$D^{\circ}: [3, \infty)$$

$$R^{\circ}$$

$$HA^{\circ}: y = 1$$

$$f(x) = \frac{x^2 - 3x + 18}{x^2 - 2x - 15} = \frac{(x-6)(x+3)}{(x-5)(x+3)}$$

$$VA^{\circ}: x = 5$$

$$Hole^{\circ}: x = -3$$

$$HA^{\circ}: y = 1$$

$$D^{\circ}: (-\infty, -3) \cup (-3, 5) \cup (5, \infty)$$