

HW Questions/Issues?.....

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

a) Domain = $\{x \in \mathbb{R} \mid x \neq -2, 3\}$
 $(-\infty, -2) \cup (-2, 3) \cup (3, \infty)$

b) $(-2, \frac{2}{3})$

c) VA: $x=3$

d) HA: $y=1$

e) OA: none

f) $f(0) = \frac{0^2+0-2}{0^2-0-6} = \frac{1}{3}$
 $(0, \frac{1}{3})$

g) x intercept $0 = \frac{x^2+x-2}{x^2-x-6}$ $\frac{1^2+1-2}{1^2-1-6} = \frac{0}{-6}$
 $(-2, 0) (1, 0)$ $0 = (x+2)(x-1)$
 $x = -2 \quad x = 1$

h)

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⑥ $f(x) = \frac{x^2-4}{x+3} \Rightarrow \frac{(x+2)(x-2)}{x+3}$

a) $\{x \in \mathbb{R} \mid x \neq -3\}$
 $(-\infty, -3) \cup (-3, \infty)$

b) no holes

c) VA: $x = -3$

d) HA: none

e) OA: $y = x - 3$

f) $f(0) = \frac{0^2-4}{0+3} = -\frac{4}{3}$ $\frac{x^2-4}{x+3} = x-3$ $\frac{r}{x+3}$
 $(0, -\frac{4}{3})$

g) $0 = \frac{x^2-4}{x+3}$
 $0 = x^2-4$
 $x = \pm 2$
 $(-2, 0) (2, 0)$

$f(-4) = \frac{(-4)^2-4}{-4+3} = \frac{12}{-1}$
 $(-4, -12)$

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$$\textcircled{a} f(x) = \frac{2x^2}{x^2-1} \Rightarrow \frac{2x^2}{(x+1)(x-1)}$$

a) Domain = $\{x \in \mathbb{R} \mid x \neq \pm 1\}$
 b) None
 c) VA: $x = -1$
 $x = 1$
 d) HA: $y = 2$
 e) OA: none
 f) y-intercept $f(0) = \frac{2(0)^2}{0^2-1} = 0$
 $(0,0)$
 g) x-intercepts $0 = \frac{2x^2}{x^2-1}$
 $(0,0)$ $0 = 2x^2$
 $0 = x$

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$$\textcircled{b} f(x) = \frac{x^2-x}{x+1} \Rightarrow \frac{x(x-1)}{x+1}$$

a) Domain $\{x \in \mathbb{R} \mid x \neq -1\}$
 $(-\infty, -1) \cup (-1, \infty)$
 b) holes
 c) VA: $x = -1$
 d) HA: none
 e) OA: $y = x - 2$
 f) y intercepts $f(0) = \frac{0^2-0}{0+1} = 0$
 $(0,0)$
 g) x intercepts $0 = \frac{x^2-x}{x+1}$
 $(0,0)$ $(1,0)$ $0 = x^2-x$
 $0 = x(x-1)$

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

$$= \frac{4+2}{-1}$$

$$= -6$$

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