4.16
7

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

(1) $x \neq 0, 2$

(2) $\lim_{x\to 0^+} \frac{1}{+0} = \infty$ $\lim_{x\to 0^-} \frac{1}{-0} = -\infty \to \boxed{x=0}$

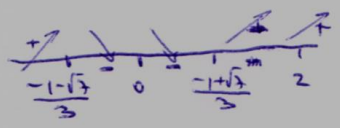
$\lim_{x\to 2^+} \frac{7}{-0} = -\infty$ $\lim_{x\to 2^-} \frac{7}{+0} = \infty \to \boxed{x=2}$

$m = \lim_{x\to\pm\infty} \frac{x^2+x+1}{x(2x-x^2)} = 0$, $n = \lim_{x\to\pm\infty} \frac{x^2+x+1}{2x-x^2} = -1 \to \boxed{y=-1}$

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

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

$0 = \frac{3x^2+2x-2}{(2x-x^2)^2}$ $x = \frac{-2\pm\sqrt{28}}{6} = \frac{-1\pm\sqrt{7}}{3}$



$x \neq 2$, $x < \frac{-1-\sqrt{7}}{3}$, $x > \frac{-1+\sqrt{7}}{3}$

עולה: $\frac{-1-\sqrt{7}}{3} < x < 0$, $0 < x < \frac{-1+\sqrt{7}}{3}$

יורדת:

max $\to x = \frac{-1-\sqrt{7}}{3}$ min $\to x = \frac{-1+\sqrt{7}}{3}$