2.75

43 (1) $x \neq -2$ (2) $(0,2)$ $3x^2+x+8=0 \rightarrow \Delta<0$

(3) $\lim_{x\to -2^+} \frac{3x^2+x+8}{(x+2)^2} = \frac{18}{+0} = \infty$ $\lim_{x\to -2^-} \frac{3x^2+x+8}{(x+2)^2} = \frac{18}{+0} = \infty \rightarrow \boxed{x=-2}$

$m = \lim_{x\to\infty} \frac{3x^2+x+8}{x(x+2)^2} = 0$ $n = \lim_{x\to\infty} \frac{3x^2+x-8}{(x+2)^2} = 3 \rightarrow \boxed{y=3}$

(4-5) $y' = \frac{(6x+1)(x+2)^2 - 2(x+2)(3x^2+x+8)}{(x+2)^2} = \frac{(x+2)\left[(6x+1)(x+2) - 6x^2 - 2x - 16\right]}{(x+2)^2} = \frac{(x+1)(11x-14)}{(x+2)^2}$

$y'=0 \rightarrow$ ~~$x=-2$~~, $x = \frac{14}{11}$

	-3	-2	0	$\frac{14}{11}$	2
y'	+		−	0	+
y	↗		↘	min	↗

$\min\left(\frac{14}{11}, \frac{415}{648}\right)$

$\forall x < -2$, $x > \frac{14}{11}$

$-2 < x < \frac{14}{11}$