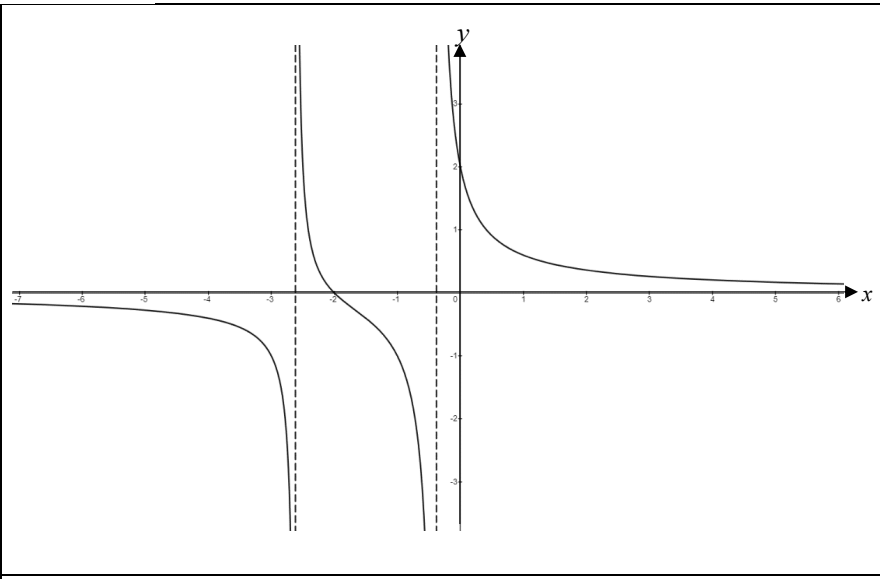
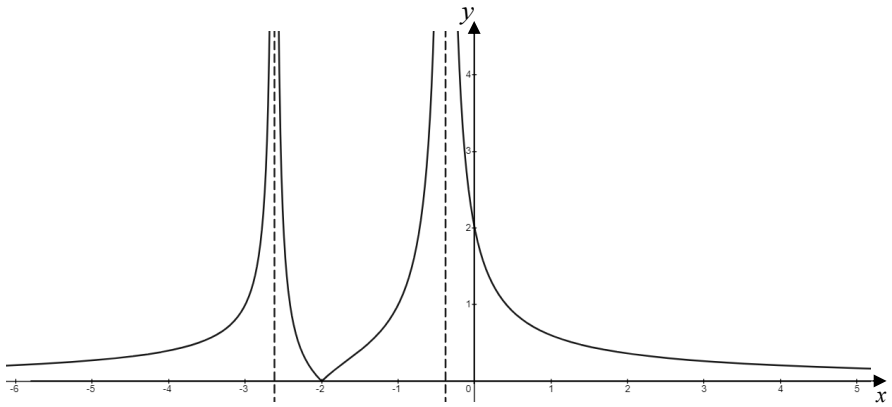
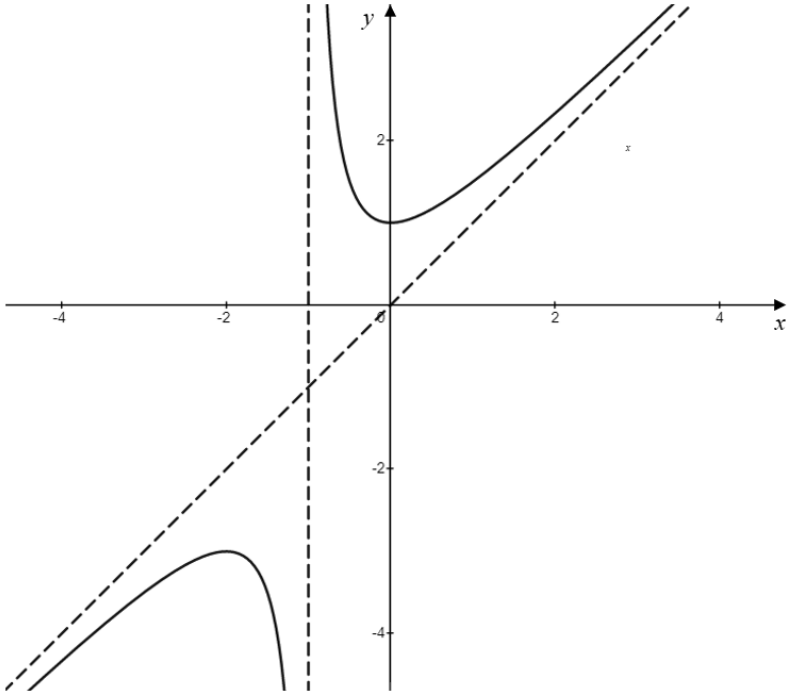
7(a)	$x=-\frac{3}{2}-\frac{1}{2}\sqrt{5}, \quad x=-\frac{3}{2}+\frac{1}{2}\sqrt{5}$
	$y=0$
7(b)	$\frac{\mathrm{d}y}{\mathrm{d}x}=\frac{(x^2+3x+1)(1)-(x+2)(2x+3)}{\left(x^2+3x+1\right)^2}$
	$x^2+4x+5=0$
	Discriminant is $4^2-20=-4<0$ so no real roots.

7(c)	

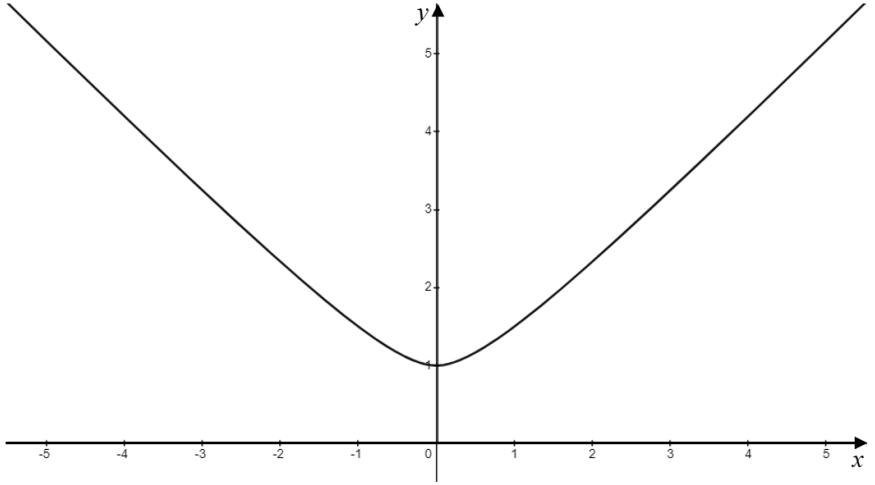
7(d)	
7(e)	$\frac{x+2}{x^2+3x+1}=2$ or $\frac{x+2}{x^2+3x+1}=-2$ $-2x^2-5x=0$ or $2x^2+7x+4=0$
	$x=-\frac{5}{2},\quad x=0$ or $x=-\frac{7}{4}-\frac{1}{4}\sqrt{17},\quad x=-\frac{7}{4}+\frac{1}{4}\sqrt{17}$
	$-\frac{7}{4}-\frac{1}{4}\sqrt{17}<x<-\frac{5}{2},\quad -\frac{7}{4}+\frac{1}{4}\sqrt{17}<x<0$, $x\neq-\frac{3}{2}\pm\frac{1}{2}\sqrt{5}$

7(a)	$x=-1$
	$y=\frac{x(x+1)+1}{x+1}$
	$y=x$
7(b)	$\frac{dy}{dx}=\frac{x^2+2x}{(x+1)^2}=0$
	$(0,1),\ (-2,-3)$

7(c)



7(d)



7(e)

$$\frac{x^2+x+1}{x+1}=3$$

$$x^2-2x-2=0$$

$$x=1+\sqrt{3}$$

$$-1-\sqrt{3}<x<1+\sqrt{3}$$

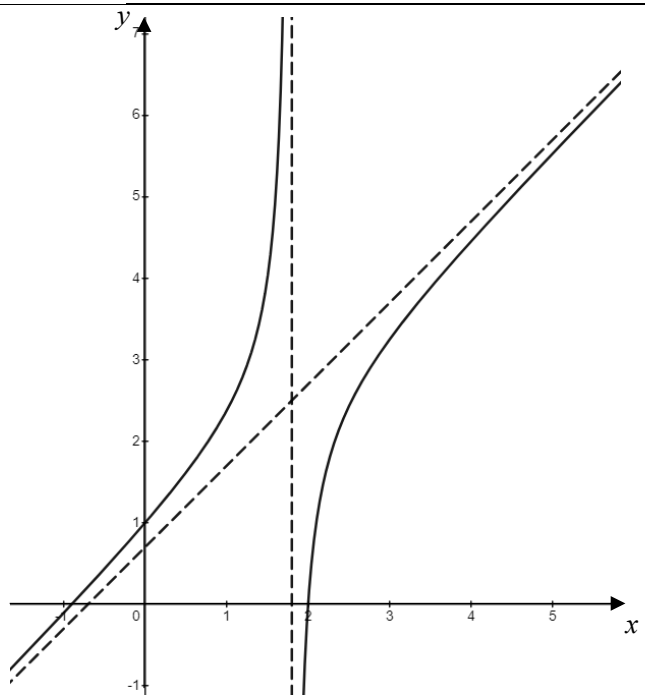
7(a)

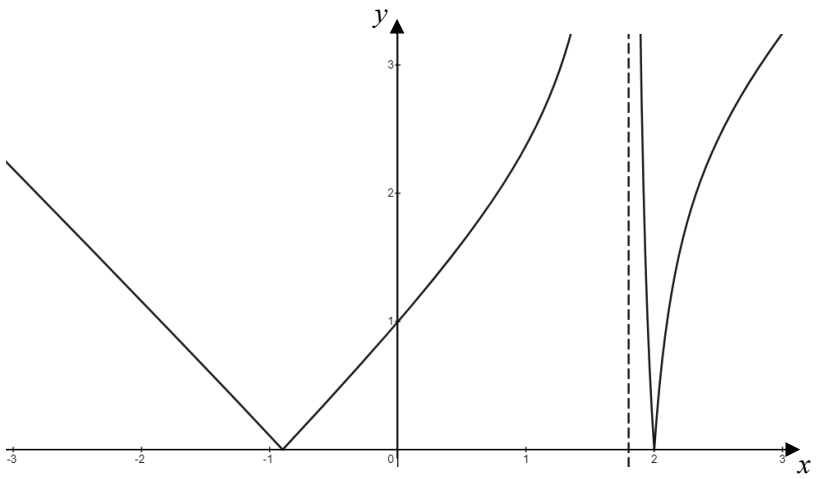
$$x=1.8$$

$$y=\frac{(10x-18)\left(x+\frac{7}{10}\right)-\frac{27}{5}}{10x-18}=x+\frac{7}{10}-\frac{\frac{27}{5}}{10x-18}$$

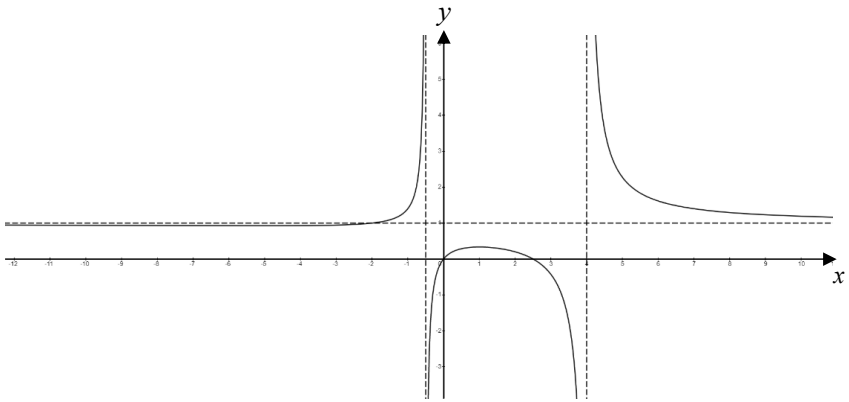
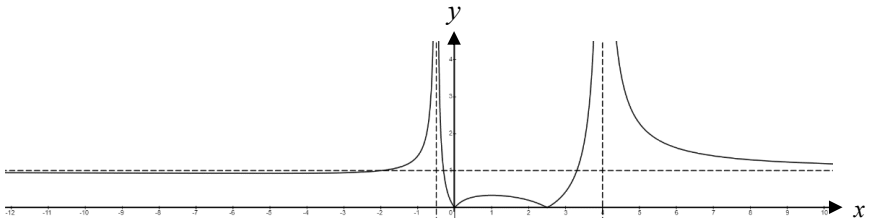
$$y=x+0.7$$

7(b)	$\frac{dy}{dx} = \frac{100x^2 - 360x + 378}{(10x-18)^2}$
	$50x^2 - 180x + 189 = 0 \quad \left(\text{or } \frac{dy}{dx} = 1 + \frac{54}{(10x-18)^2} \right)$
	$180^2 - 4(50)(189) = -5400 < 0$ (or $y' > 0$) $\Rightarrow$ No stationary points

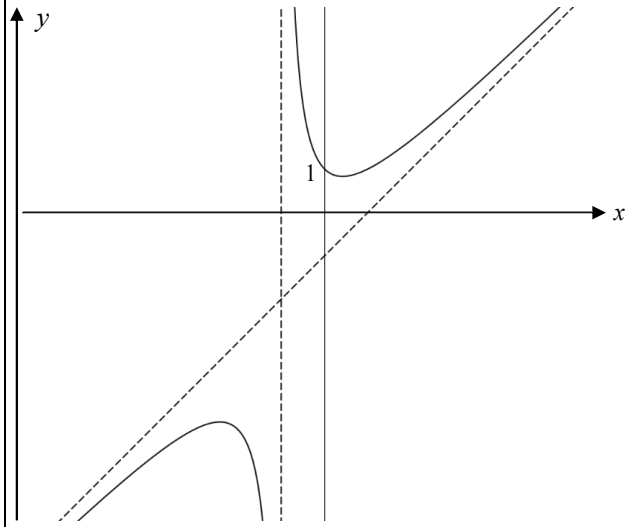
7(c)	
	$(0,1), \quad (-0.9,0), \quad (2,0)$

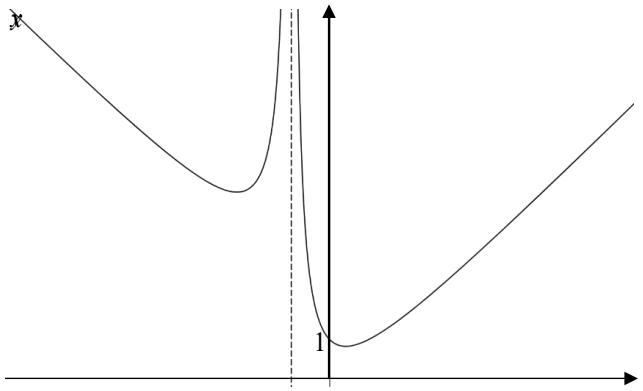
7(d)	
7(e)	$\left[\dfrac{10x^2-11x-18}{10x-18}=-4\Rightarrow x=\dfrac{-29\pm\sqrt{4441}}{20}\right]$
	$\dfrac{10x^2-11x-18}{10x-18}=4$
	$10x^2-51x+54=0$
	$p=\frac{3}{2},\ \ q=\frac{18}{5}$

7(a)	$x=-\frac{1}{2},\ \ x=4$
	$y=1$
7(b)	$\dfrac{\mathrm{d}y}{\mathrm{d}x}=\dfrac{(2x^2-7x-4)(4x-5)-(2x^2-5x)(4x-7)}{\left(2x^2-7x-4\right)^2}$
	$4x^2+16x-20=0$
	$\left(-5,\frac{25}{27}\right)\ \left(1,\frac{1}{3}\right)$

7(c)	
	$(0,0),\ \ \left(\frac{5}{2},0\right)$
7(d)	

7(e)	$\frac{2x^2-5x}{2x^2-7x-4}=\frac{1}{9}$ or $\frac{2x^2-5x}{2x^2-7x-4}=-\frac{1}{9}$ $16x^2-38x+4=0$ or $20x^2-52x-4=0$
	$x=\frac{19}{16}+\frac{3}{16}\sqrt{33},\quad x=\frac{19}{16}-\frac{3}{16}\sqrt{33}$ or $x=\frac{13}{10}+\frac{3}{10}\sqrt{21},\quad x=\frac{13}{10}-\frac{3}{10}\sqrt{21}$
	$\frac{13}{10}-\frac{3}{10}\sqrt{21}<x<\frac{19}{16}-\frac{3}{16}\sqrt{33},\ \ \frac{19}{16}+\frac{3}{16}\sqrt{33}<x<\frac{13}{10}+\frac{3}{10}\sqrt{21}$

6(a)	$x=-a$
	$y=\frac{(x+a)(x-a)+a^2+a}{x+a}=x-a+\frac{a^2+a}{x+a}$
	$y=x-a$
6(b)	$\frac{\mathrm{d}y}{\mathrm{d}x}=1-(a^2+a)(x+a)^{-2}=0$ or $x^2+2ax-a=0$
	$x=-a\pm\sqrt{a^2+a}$
6(c)	

6(d)	
6(e)	$\frac{x^2+a}{x+a}=a$ $x^2-ax+a-a^2=0$
	Or $\frac{x^2+a}{x+a}=-a \Rightarrow x^2+ax+a+a^2=0$
	$a^2-4\left(a-a^2\right)=5a^2-4a>0$
	$a>\frac{4}{5}$.