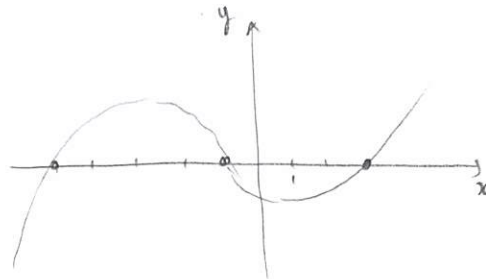


Sign Analysis – Extra Practice

1. Determine the signs of the following expressions (and imagine what the graph can look like).

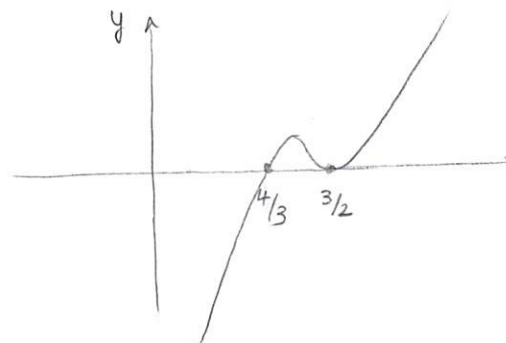
a) $f(x) = (x-3)(5+x)(x+1)$

x	$-\infty$	-5	-1	3	$+\infty$
$x-3$	-	-	-	0	+
$5+x$	-	0	+	+	+
$x+1$	-	-	0	+	+
$f(x)$	-	0	+	0	+



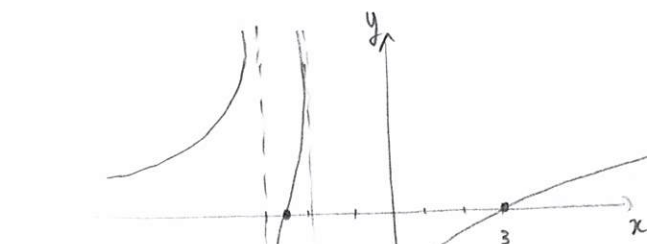
b) $g(x) = (2x-3)^2(3x-4)^3$

x	$-\infty$	$4/3$	$3/2$	$+\infty$
$(2x-3)^2$	+	+	0	+
$(3x-4)^3$	-	0	+	+
$g(x)$	-	0	+	+



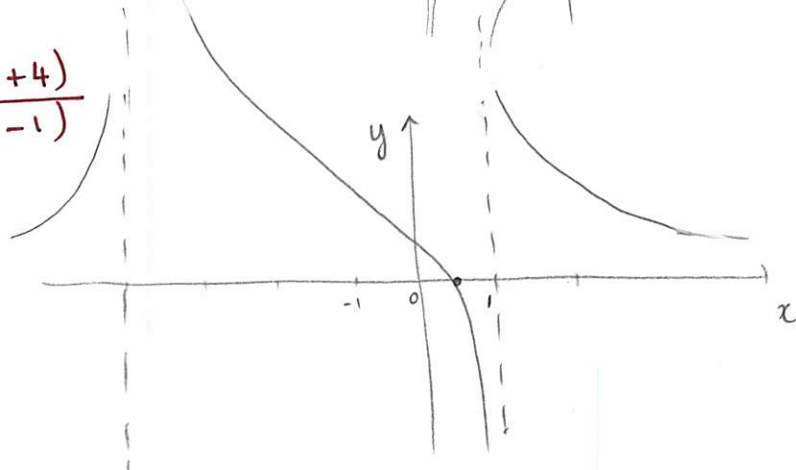
c) $h(x) = \frac{2x^2-x-15}{x^2+5x+6} = \frac{(2x+5)(x-3)}{(x+2)(x+3)}$

x	$-\infty$	-3	$-5/2$	-2	3	$+\infty$			
$2x+5$	-	-	0	+	+	+			
$x-3$	-	-	-	-	0	+			
$x+2$	-	-	-	0	+	+			
$x+3$	-	0	+	+	+	+			
$h(x)$	+		-	0	+		-	0	+



d) $k(x) = \frac{2x^2+7x-4}{x^2+3x-4} = \frac{(2x-1)(x+4)}{(x+4)(x-1)}$

x	$-\infty$	-4	$1/2$	1	$+\infty$		
$2x-1$	-	-	0	+	+		
$x+4$	-	0	+	+	+		
$x+4$	-	0	+	+	+		
$x-1$	-	-	-	0	+		
$k(x)$	+		+	0	-		+



2. Solve the following inequalities and write your answer as an interval.

a) $(2-x)(x+5) > 0$

x	$-\infty$	-5	2	$+\infty$
$2-x$		+	+ 0 -	
$x+5$		- 0 +		+
		- 0 + 0 -		

solution: $(-5, 2)$

b) $(2x-5)(x+3)(2x-4) \leq 0$

x	$-\infty$	-3	2	$5/2$	$+\infty$
$2x-5$		-	- 0 +		+
$x+3$		- 0 +		+	+
$2x-4$		-	- 0 +		+
		- 0 + 0 - 0 +			

solution: $(-\infty, -3] \cup [2, \frac{5}{2}]$

c) $\frac{x^2+x-6}{x+1} < 0$ i.e. $\frac{(x+3)(x-2)}{x+1} < 0$

x	$-\infty$	-3	-1	2	$+\infty$
$x+3$		- 0 +		+	+
$x-2$		-	- 0 +		+
$x+1$		-	- 0 +		+
		- 0 +		- 0 +	

solution: $(-\infty, -3) \cup (-1, 2)$

d) $\frac{x^2-4x+4}{x^2+2x-3} \geq 0$ i.e. $\frac{(x-2)^2}{(x+3)(x-1)} \geq 0$

x	$-\infty$	-3	1	2	$+\infty$
$(x-2)^2$		+	+	+ 0 +	
$x+3$		- 0 +		+	+
$x-1$		-	- 0 +		+
		+		-	+ 0 +

solution: $(-\infty, -3) \cup (1, +\infty)$