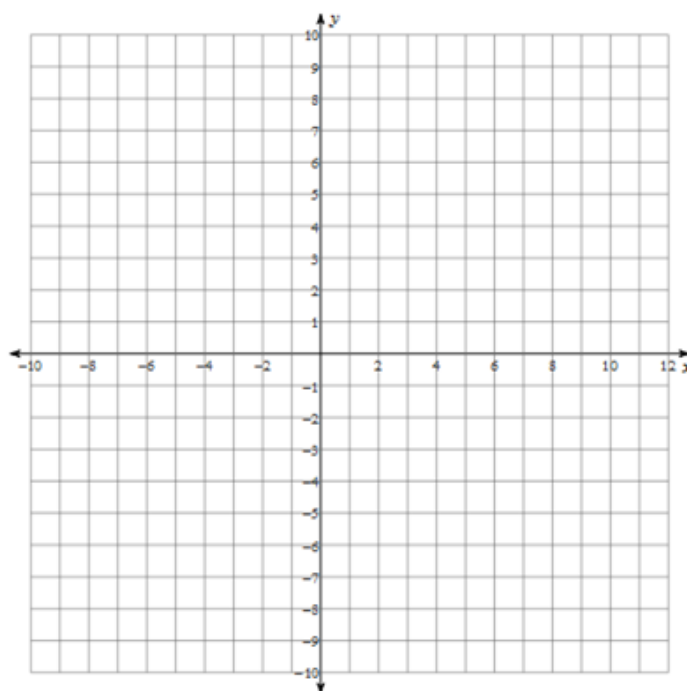


## Extra Practice: Crossing Asymptotes

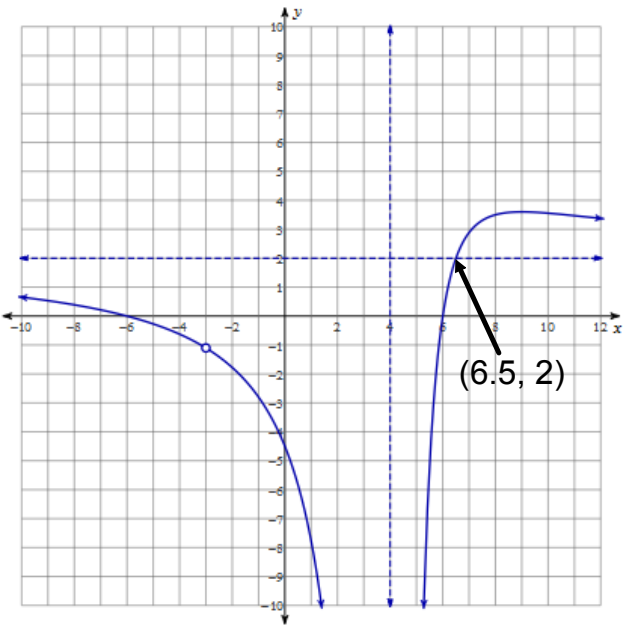
1. Sketch the graph of the function  $f(x) = \frac{2x^3 + 6x^2 - 72x - 216}{x^3 - 5x^2 - 8x + 48} = \frac{2(x+3)(x+6)(x-6)}{(x+3)(x-4)^2}$  and determine if and where the function crosses the horizontal or oblique asymptote.

x-intercepts	$(-6, 0), (6, 0)$
y-intercept	$(0, -4.5)$
Vertical Asymptote(s)	$x = 4$
Point(s) of Discontinuity	$(-3, -1)$
Horizontal Asymptote	$y = 2$
Oblique Asymptote	none
Coordinates of Point(s) where graph crosses the asymptote	$(6.5, 2)$
Other key points	$(1, -7.7)$ $(8, 3.5)$

etc.

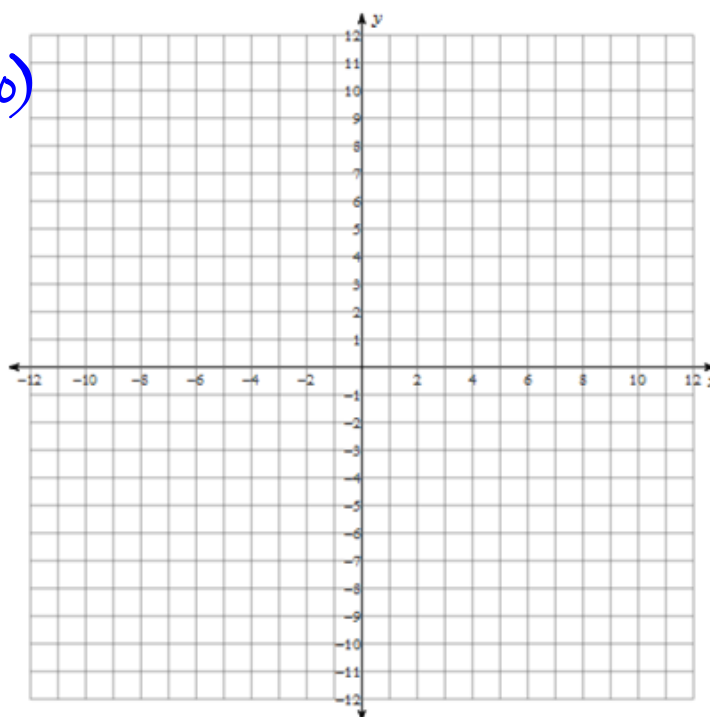


Extra Practice # 1)

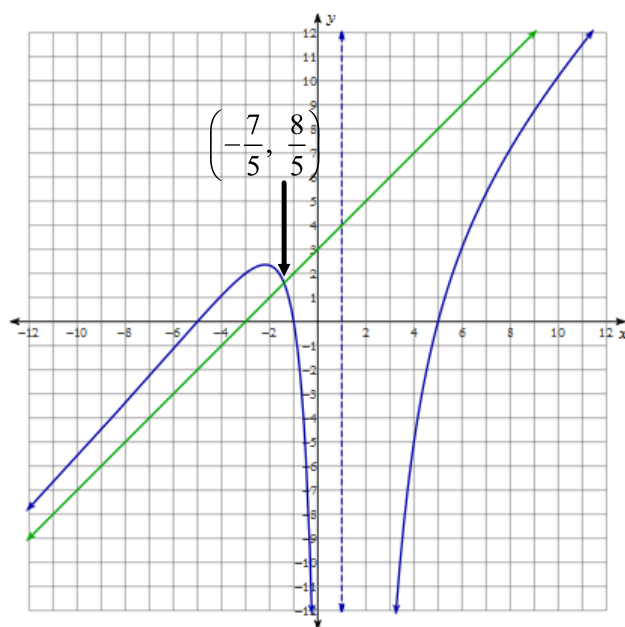


2. Sketch the graph of the function  $f(x) = \frac{x^3 + x^2 - 25x - 25}{x^2 - 2x + 1} = \frac{(x+1)(x+5)(x-5)}{(x-1)^2}$  and determine if and where the function crosses the horizontal or oblique asymptote.

x-intercepts	$(-5, 0), (-1, 0), (5, 0)$
y-intercept	$(0, -25)$
Vertical Asymptote(s)	$x = 1$
Point(s) of Discontinuity	none
Horizontal Asymptote	none
Oblique Asymptote	$y = x + 3$
Coordinates of Point(s) where graph crosses the asymptote	$(-\frac{7}{5}, \frac{8}{5})$
Other key points	$(-10, -5.58)$ $(-3, 2)$ $(4, -5)$ $(9, 8.75)$ etc.

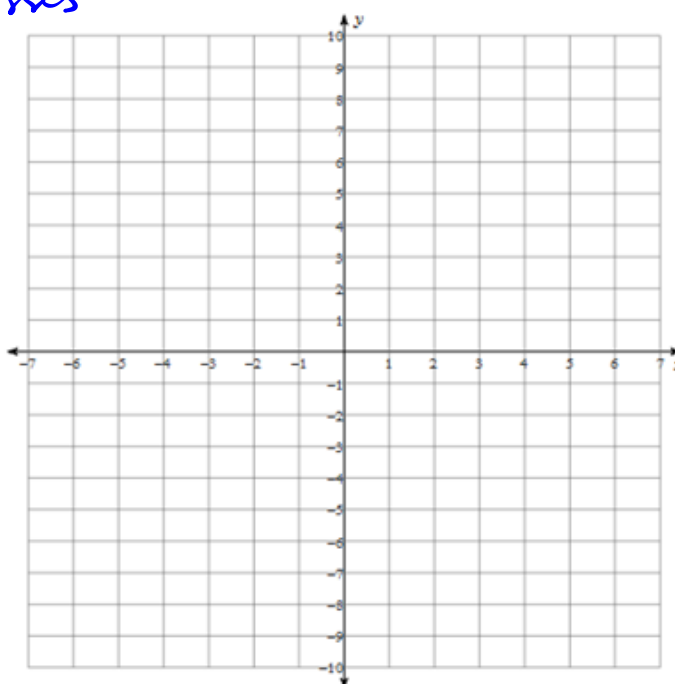


Extra Practice # 2)



3. Sketch the graph of the function  $f(x) = \frac{x^4 - x^3 - 12x^2 - 4x + 16}{x^3 - x^2 - 8x + 12} = \frac{(x-1)(x-4)(x+2)^2}{(x+3)(x-2)^2}$  and determine if and where the function crosses the horizontal or oblique asymptote.

x-intercepts	$(-2,0), (1,0), (4,0)$
y-intercept	$(0, \frac{4}{3})$
Vertical asymptote(s)	$x = -3, x = 2$
Point(s) of Discontinuity	none
Horizontal asymptote	none
Oblique asymptote	$y = x$
Coordinates of Point(s) where graph crosses the asymptote	$(-4.8, -4.8)$ $(0.8, 0.8)$
Other key points	$(-4, -4.\bar{4})$ $(-1, 0.\bar{5})$ $(3, -8.\bar{3})$ $(6, 4.\bar{4})$ etc.



Extra Practice # 3)

