

Steps

$$\frac{(x-4) \cdot 3}{(x-4)(x+2)} + \frac{(x+5)(x+2)}{(x-4)(x+2)}$$

Restriction:

$$x \neq -2$$

$$x \neq 4$$

$$\frac{3x-12 + x^2+7x+10}{(x-4)(x+2)} \quad 2) \text{ Simplify}$$

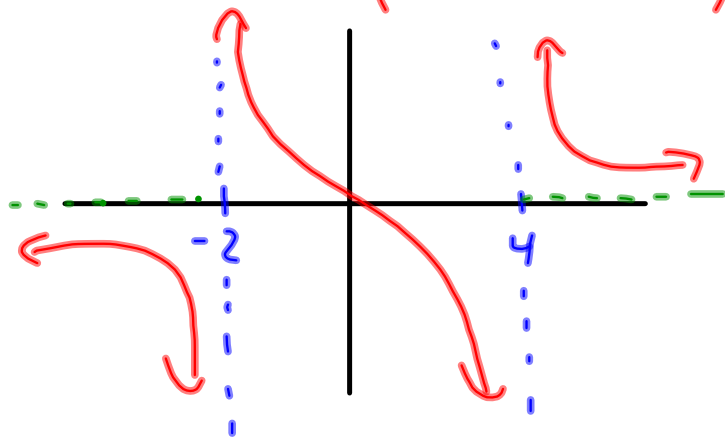
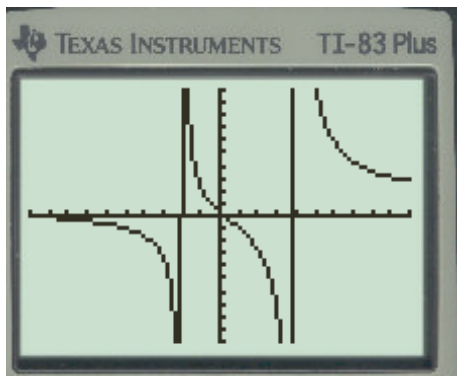
$$\frac{x^2+10x-2}{(x-4)(x+2)}$$

$$VA: x=4 \text{ \& } y=-2$$

Graph: $y=$

type rational equation

$$(x^2+10x-2) / ((x-4)(x+2))$$



$$\frac{5x}{x+1} \rightarrow \frac{(x+2)}{3}$$

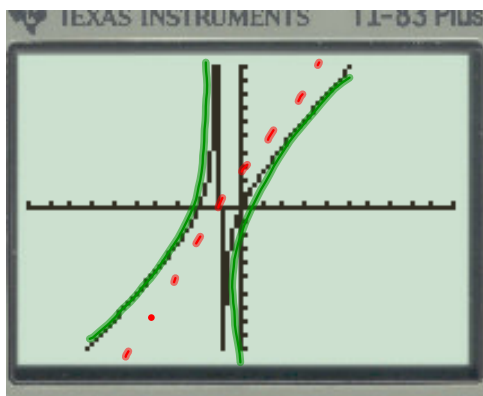
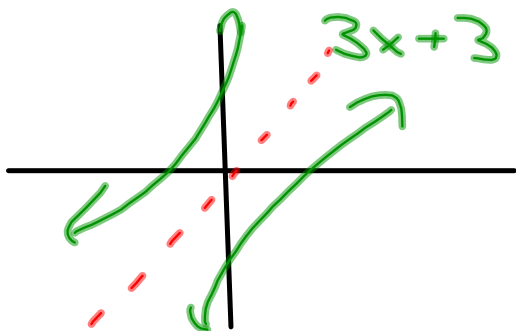
$$\frac{[5x(x+2)]}{[(x+1)(3)]}$$

Restriction

$$x \neq -1$$

VA: $x = -1$

Graph: $\frac{5x^2 + 10x}{3x + 3}$



Division

$$\frac{(x+3)}{(x+2)} \div \frac{(x+1)}{x^2+8x+12}$$

$(x+2)(x+6)$

copy change flip

$$\frac{(x+3)}{(x+2)} \cdot \frac{(x+2)(x+6)}{(x+1)}$$

Hole

$$\frac{(x+3)\cancel{(x+2)}(x+6)}{\cancel{(x+2)}(x+1)}$$

Hole

$$x+2=0$$

$$x=-2$$

Restrictions

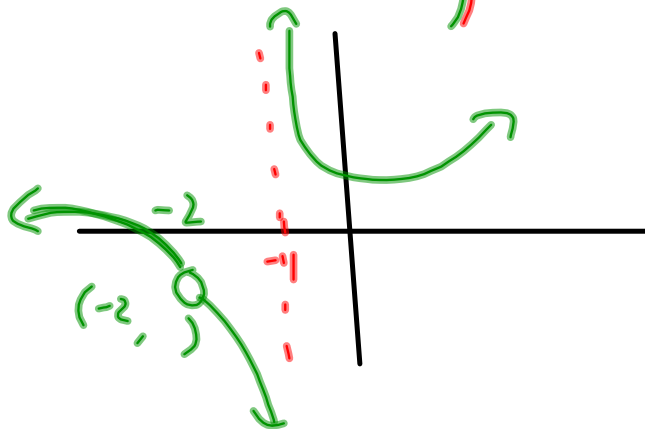
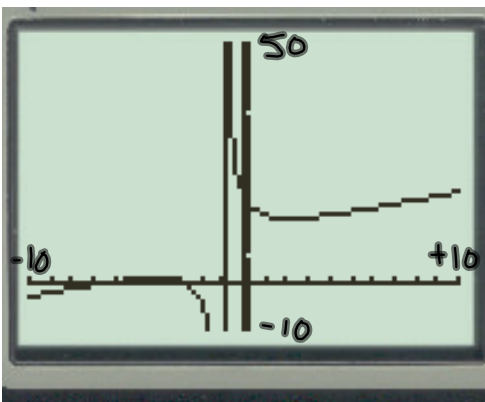
$$x \neq -2$$

$$x \neq -2 \quad x \neq -6$$

Restrictions

$$x \neq -2 \quad x \neq -1$$

Graph: $\left(\frac{(x+3)\cancel{(x+2)}(x+6)}{\cancel{(x+2)}(x+1)} \right)$



Division

$$\frac{(x+3)}{(x+2)} \div \frac{(x+1)}{x^2+8x+12}$$

$(x+2)(x+6)$

copy change flip

$$\frac{(x+3)}{(x+2)} \cdot \frac{(x+2)(x+6)}{(x+1)}$$

Restrictions

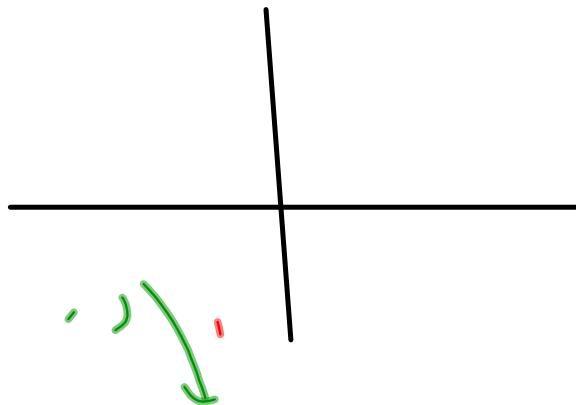
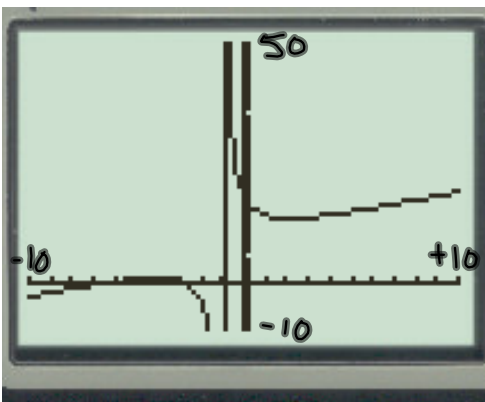
$x \neq -2$

$x \neq -2 \quad x \neq -6$

Restrictions

$x \neq -2 \quad x \neq -1$

$$\frac{(x+3)}{(x+2)} \div \frac{(x+1)}{x^2+8x+12} = \frac{(x+3)}{5}$$



$$9) \frac{6x+5}{x^2+8x+15} - 2$$

$$2 = \frac{2}{1}$$

$$\frac{6x+5}{x^2+8x+15} - \frac{2}{1} \cdot \frac{(x^2+8x+15)}{(x^2+8x+15)}$$

$$\frac{6x+5 - 2x^2 - 16x - 30}{x^2+8x+15}$$

$$\frac{-2x^2 - 10x - 25}{x^2+8x+15}$$

$$\frac{-2x^2 - 10x - 25}{(x+3)(x+5)}$$

$$P/Q = \frac{1, 3, 5, 25}{1, 2}$$

$$(x+3) \quad x = -3$$

$$(x+5) \quad x = -5$$

$$\begin{array}{r} -3 \overline{) -2 \quad -10 \quad -25} \\ \underline{-6} \\ -2 \\ \underline{-6} \\ -2 \\ \underline{-6} \\ -2 \end{array}$$

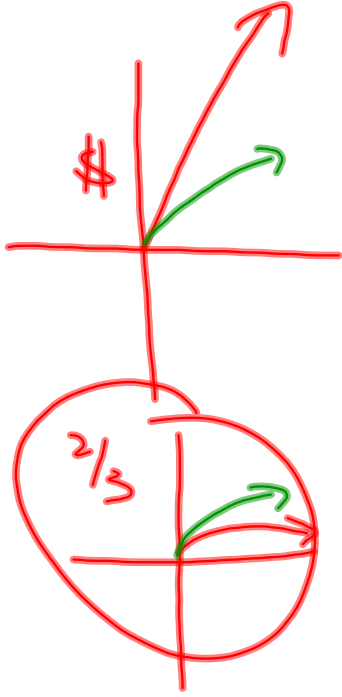
$$\begin{array}{r} -5 \overline{) -2 \quad -10 \quad -25} \\ \underline{-10} \\ -2 \\ \underline{-10} \\ -2 \\ \underline{-10} \\ -2 \end{array}$$

No Holes

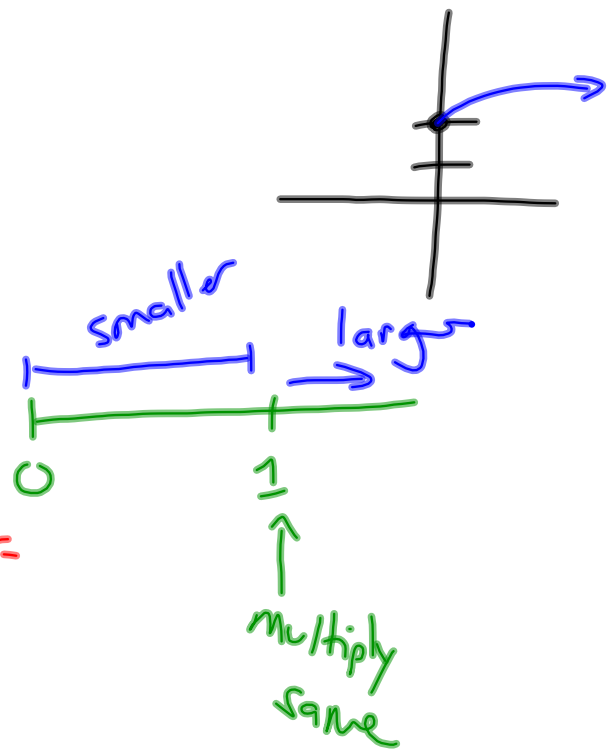
$$VA: \quad x = -3$$

$$\quad \quad x = -5$$

24) $y = \frac{2}{3}\sqrt{x+2}$



$\sqrt{x} = 1$
 $\frac{2}{3}(1) =$



\$53.45

tax .06

3.20

53.45(1)
+ 53.45(.06)

53.45
+ 3.20

56.65

53.45
x 1.06

56.65

$$\begin{array}{r} 275 \\ \times \quad .78 \\ \hline \end{array} \qquad \begin{array}{r} 275 \\ \times \quad .81 \\ \hline \end{array}$$

6%

15.78

16.00

1.60 $\approx 10\%$

\$58

25%

$$\begin{array}{r} 5.8 \times 5 \\ 5.8 \times 5 \\ + 2.63 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ \hline 12 \end{array}$$

$$\frac{3x}{(x+1)} + \frac{(x+4)}{(x+5)}$$

Steps

Restrictions:

$$x \neq -1$$

$$x \neq -5$$

$$\frac{(x+5)}{(x+5)} \cdot \frac{3x}{(x+1)} + \frac{(x+4)(x+1)}{(x+5)(x+1)}$$

$$\frac{3x^2 + 15x + x^2 + 5x + 4}{(x+5)(x+1)}$$

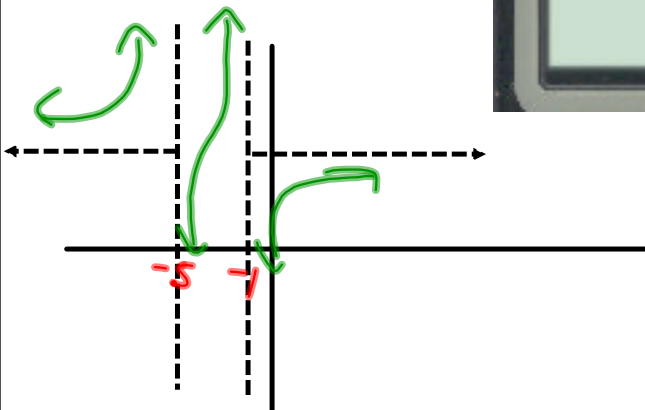
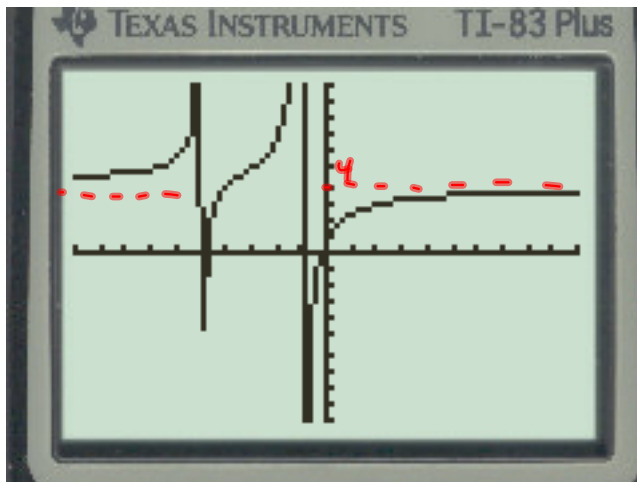
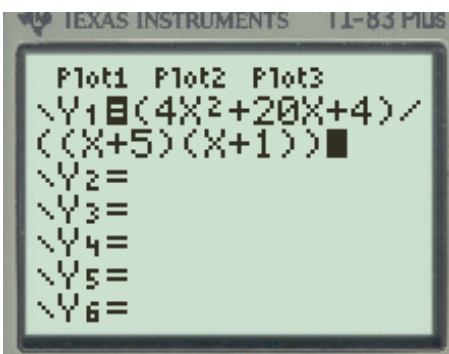
$$P/Q = \frac{1, 2, 4}{1, 2, 4}$$

$$\frac{4x^2 + 20x + 4}{(x+5)(x+1)}$$

Holes: $\begin{array}{r} 4 \quad 20 \quad 4 \\ \downarrow \quad \times \quad \downarrow \\ 4 \quad -4 \quad 4 \\ \hline 4 \quad 16 \end{array}$

VA:

$$x = -5 \quad x = -1$$



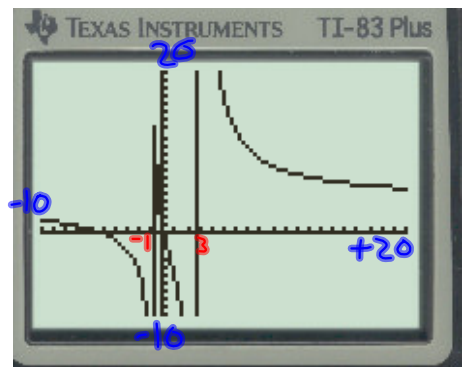
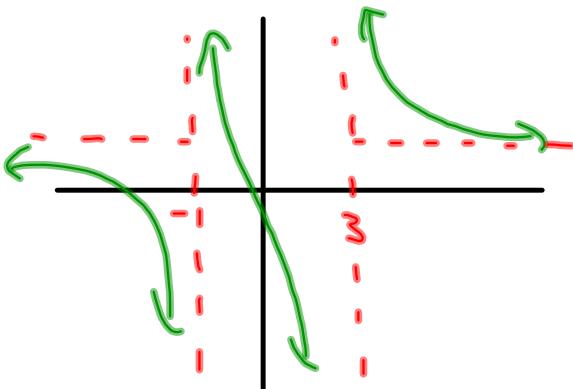
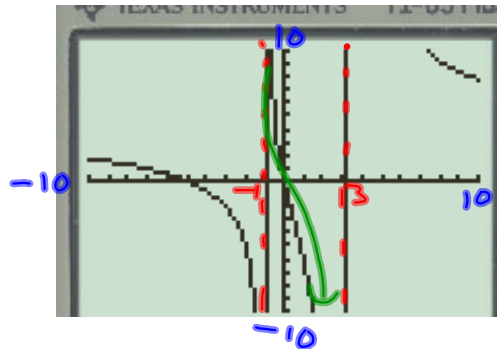
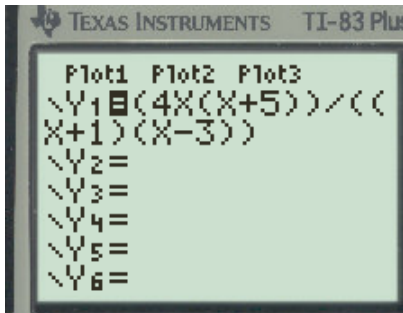
$$\frac{4x}{(x+1)} \rightarrow \frac{(x+5)}{(x-3)}$$

$$\frac{(4x(x+5))}{((x+1)(x-3))}$$

Restrictions

$$x \neq -1 \quad x \neq 3$$

$$VA: x = -1 \quad x = 3$$



$$\frac{(x+1)}{(x+6)} \div \frac{(x+4)}{x^2+8x+12}$$

$(x+2)(x+6)$

Restriction

$$x \neq -6$$

$$x \neq -2 \quad x \neq -6$$

copy change flip

$$\frac{(x+1)}{(x+6)} \rightarrow \frac{(x+2)(x+6)}{(x+4)}$$

Restrictions

$$x \neq -6 \quad x \neq -4$$

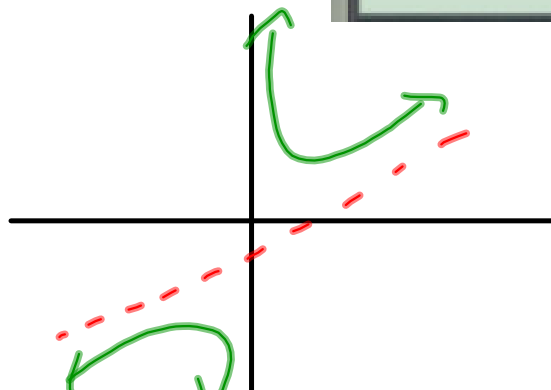
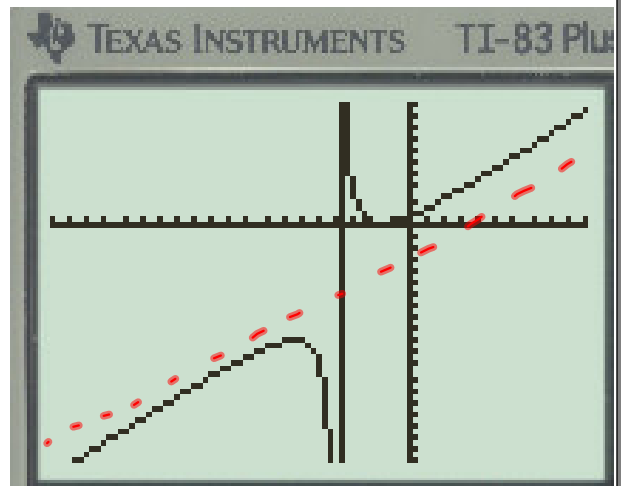
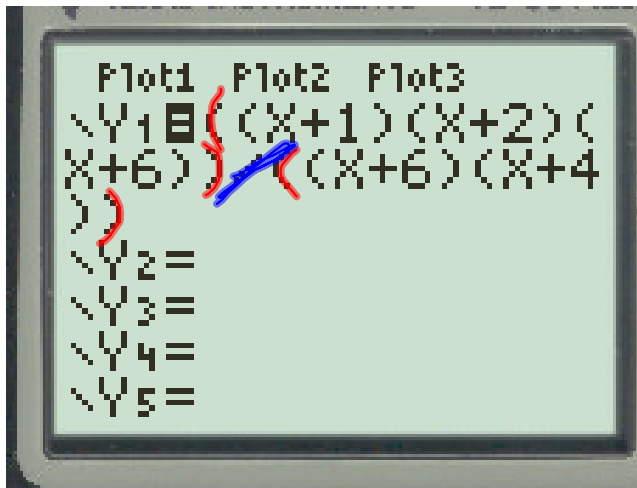
③ highest exponent is on top → slant asymptote

$$\frac{(x+1)(x+2)(x+6)}{(x+6)(x+4)}$$

x^2

Hole
 $x = -6$

VA: $x = -4$



9) $\frac{6x+5}{x^2+8x+15} - 2$ $2 = \frac{2}{1}$

$\frac{6x+5}{x^2+8x+15} - \frac{2}{1} \cdot \frac{(x^2+8x+15)}{(x^2+8x+15)}$

$\frac{6x+5 - 2x^2 - 16x - 30}{(x^2+8x+15)}$

$\frac{-2x^2 - 10x - 25}{(x+3)(x+5)}$

$P/q = \pm \frac{1,5,25}{1,2}$

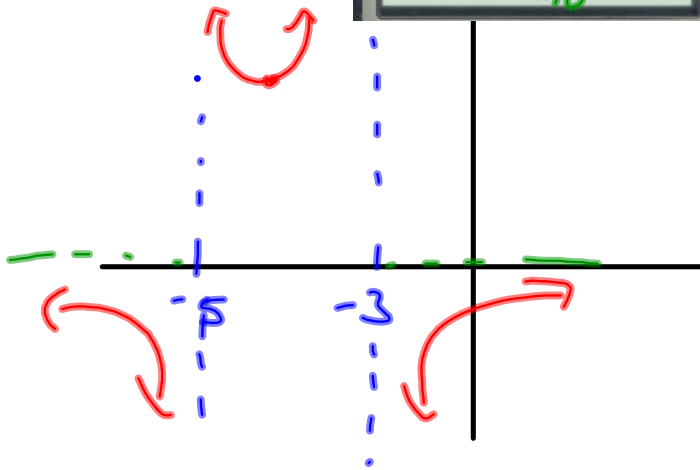
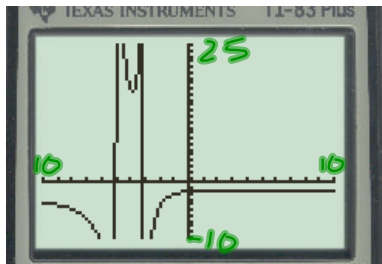
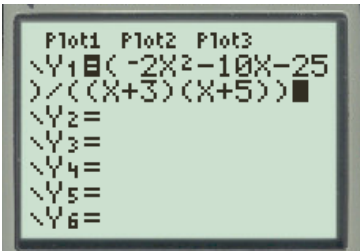
$x+5=0$
 $x=-5$

$-5 \overline{) -2 \ -10 \ -25}$
 $\phantom{-5 \overline{) }} \downarrow 10 $
 $\phantom{-5 \overline{) }} -2 25$

Not A FACTOR

NA:

$x = -3 \quad x = -5$



| X | Y1 |
|----|--------|
| -5 | ERROR |
| -4 | 17 |
| -3 | ERROR |
| -2 | -4.333 |
| -1 | -2.125 |
| 0 | -1.667 |
| 1 | -1.542 |

$$\frac{x+3}{(x+1)} + \frac{2x}{(x-4)}$$

Restrictions

$$x+1=0 \quad x \neq 4$$

$$x \neq -1$$

$$\frac{(x-4)}{(x-4)} \frac{(x+3)}{(x+1)} + \frac{2x}{(x-4)} \frac{(x+1)}{(x+1)}$$

$$\frac{x^2 - x - 12 + 2x^2 + 2x}{(x+1)(x-4)}$$

$\rightarrow P/a = \frac{1, 2, 3, 4, 12}{1, 3}$

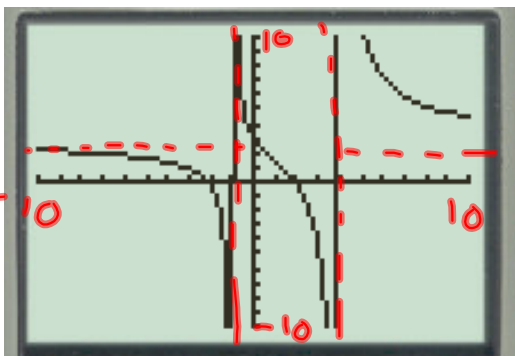
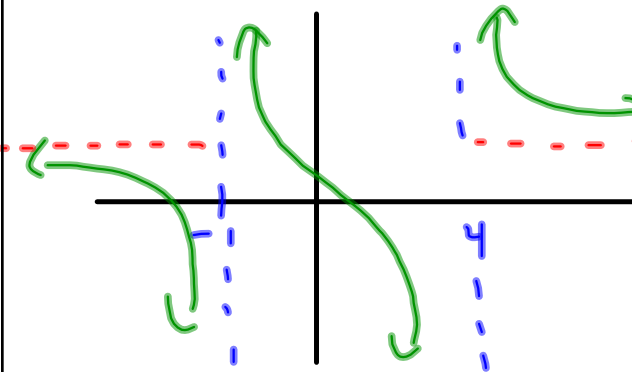
$$\frac{3x^2 + x - 12}{(x+1)(x-4)}$$

Holes: None

$$\begin{array}{r} 3 \quad 1 \quad -12 \\ \downarrow \quad -3 \\ \hline 3 \quad \cdot 2 \end{array}$$

$$\begin{array}{r} 3 \quad 1 \quad -12 \\ \downarrow \quad 12 \\ \hline 3 \quad 13 \end{array}$$

VA: $x = -1 \quad x = 4$

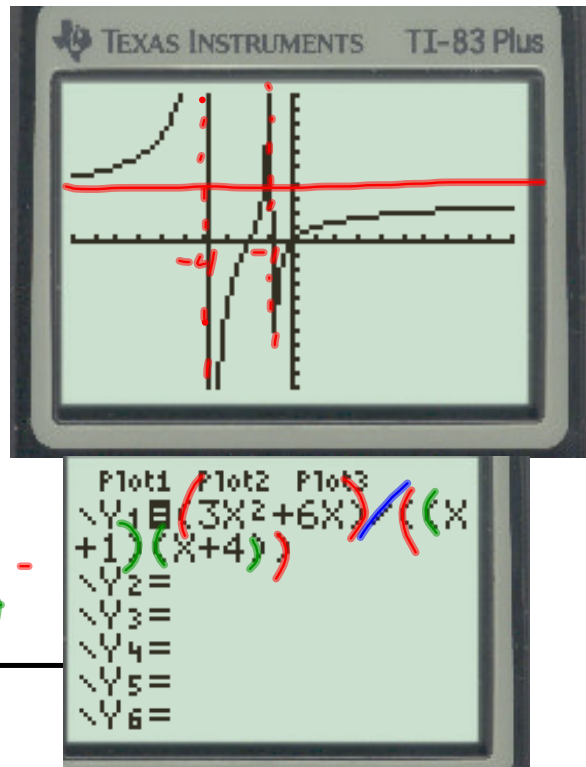
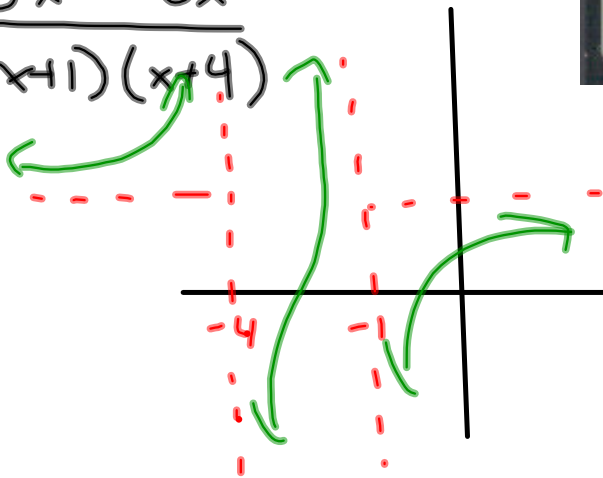


```

Plot1 Plot2 Plot3
Y1=(3X^2+X-12)/(
(X+1)(X-4))
Y2=
Y3=
Y4=
Y5=
Y6=
    
```

$$\frac{(x+2)}{(x+1)} \rightarrow \frac{3x}{(x+4)}$$

$$\frac{3x^2+6x}{(x+1)(x+4)}$$



$$\frac{(x+4)}{(x+1)} \div \frac{3x}{x^2+6x+5}$$

$(x+1)(x+5)$

Restrictions

$x \neq -1$
 $x \neq -1 \quad x \neq -5$

copy change flip

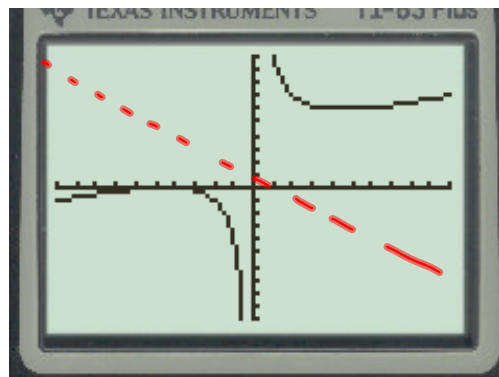
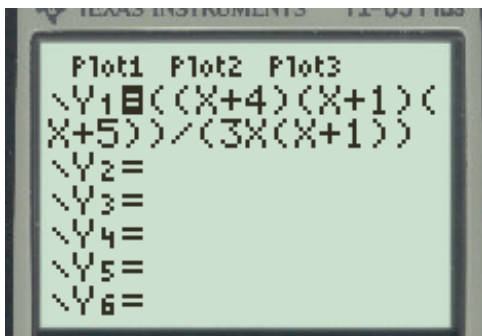
$$\frac{(x+4)}{(x+1)} \cdot \frac{(x+1)(x+5)}{3x}$$

Restrictions

$x \neq -1 \quad x \neq 0$

x^3 ← highest exponent on top — slant asymptote
 Holes
 $x^2 \frac{(x+4)\cancel{(x+1)}(x+5)}{3x\cancel{(x+1)}}$

Hole @ $x+1=0$
 $x=-1$



$$9) \frac{6x+5}{x^2+8x+15} \cdot \frac{-2(x^2+8x+15)}{1(x^2+8x+15)}$$

$$\frac{6x+5-2x^2-16x-30}{x^2+8x+15}$$

$$\frac{-2x^2-10x-25}{x^2+8x+15}$$

$\frac{p}{q} = \frac{1, 5, 25}{1, 2}$

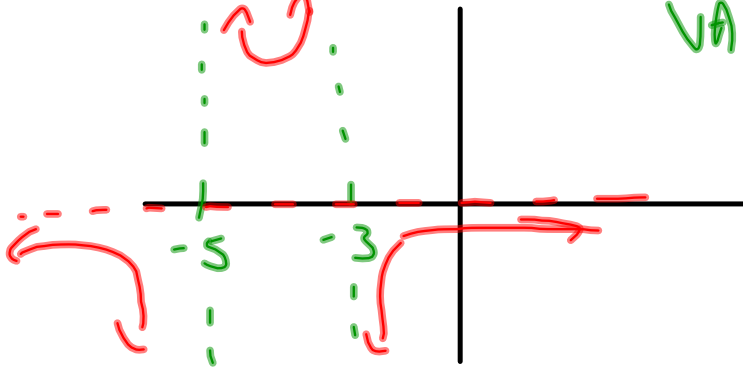
$$\begin{array}{r} -5 \) \ -2 \ -10 \ -25 \\ \underline{-2 \ -10 \ -25} \\ 0 \end{array}$$

$$\frac{x^2+8x+15}{(x+5)(x+3)}$$

$x = -5$ $x = -3$

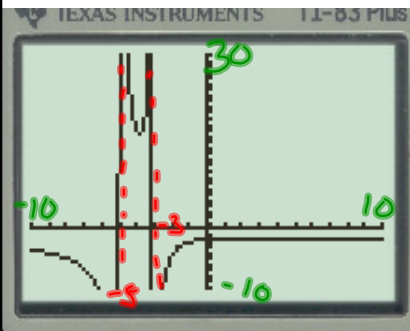
$$= \frac{-2x^2-10x-25}{(x+5)(x+3)}$$

VA: $x = -5$ $x = -3$



```

Plot1 Plot2 Plot3
\Y1 (-2X^2-10X-25)
\Y2 (X^2+8X+15)
\Y3 =
\Y4 =
\Y5 =
\Y6 =
    
```



| X | Y1 |
|----|--------|
| -6 | -12.33 |
| -5 | ERROR |
| -4 | 17 |
| -3 | ERROR |
| -2 | -4.333 |
| -1 | -2.125 |
| 0 | -1.667 |

X = -6

