

Graphing Rational Functions Practice

name Key

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

VA: \_\_\_\_\_ hole(s):  $(2, 3)$   
 $(4, -5)$

HA: \_\_\_\_\_ Slant: \_\_\_\_\_

x-int:  $(3, 0)$  yint:  $(0, 3)$   
 $(-1, 0)$

9)  $f(x) = \frac{2x^3 - 7x^2 - 4x}{x^2 - x - 12} = \frac{x(2x^2 - 7x - 4)}{(x-4)(x+3)}$

VA:  $x = -3$  hole(s):  $(4, \frac{36}{7})$

HA: \_\_\_\_\_ Slant:  $y = 2x - 5$

x-int:  $(0, 0)$  yint:  $(0, 0)$   
 $(-1/2, 0)$

(see bottom of page)

10) \*may need a calculator to graph  $(x^2-9)(x^2-1)$

$f(x) = \frac{x^4 - 10x^2 + 9}{x^3} \frac{(x+3)(x-3)(x+1)(x-1)}{x^3}$

VA:  $x = 0$  hole(s): \_\_\_\_\_

HA: \_\_\_\_\_ Slant:  $y = x$

x-int:  $(3, 0)$  yint: \_\_\_\_\_  
 $(1, 0)$   
 $(-3, 0)$   $(-1, 0)$

11)  $f(x) = \frac{(x-2)(x+3)}{(x-2)(x-4)}$

VA:  $x = 4$  hole(s):  $(2, -\frac{5}{2})$

HA:  $y = 1$  Slant: \_\_\_\_\_

x-int:  $(-3, 0)$  yint:  $(0, -\frac{3}{4})$

12)  $f(x) = \frac{(x+3)(6-x)}{(x-2)(x+3)} \frac{(-x+6)}{(x-2)}$

VA:  $x = 2$  hole(s):  $(-3, -\frac{9}{5})$

HA:  $y = -1$  Slant: \_\_\_\_\_

x-int:  $(6, 0)$  yint:  $(0, -3)$

13)  $f(x) = \frac{x^2 + x - 20}{x - 4} \frac{(x+5)(x-4)}{(x-4)} = x+5$

VA: \_\_\_\_\_ hole(s):  $(4, 9)$

HA: \_\_\_\_\_ Slant: \_\_\_\_\_

x-int:  $(-5, 0)$  yint:  $(0, 5)$

Describe the conditions that would produce a rational function without a vertical asymptote.

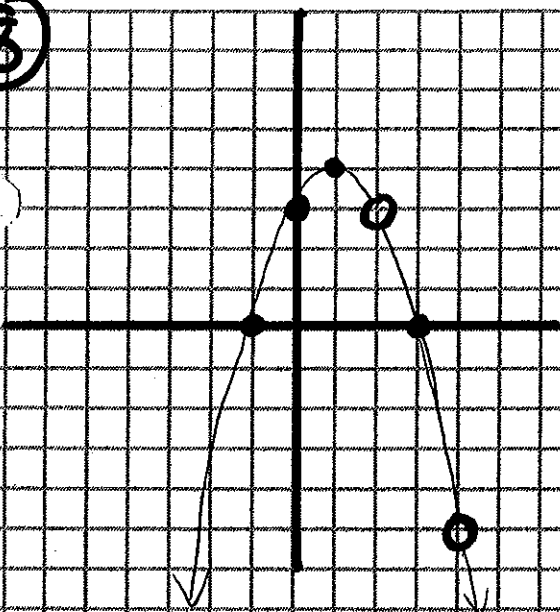
Describe how you would determine whether a rational function has a horizontal or slant asymptote.

Describe how you would determine whether a rational function has a vertical asymptote or hole.

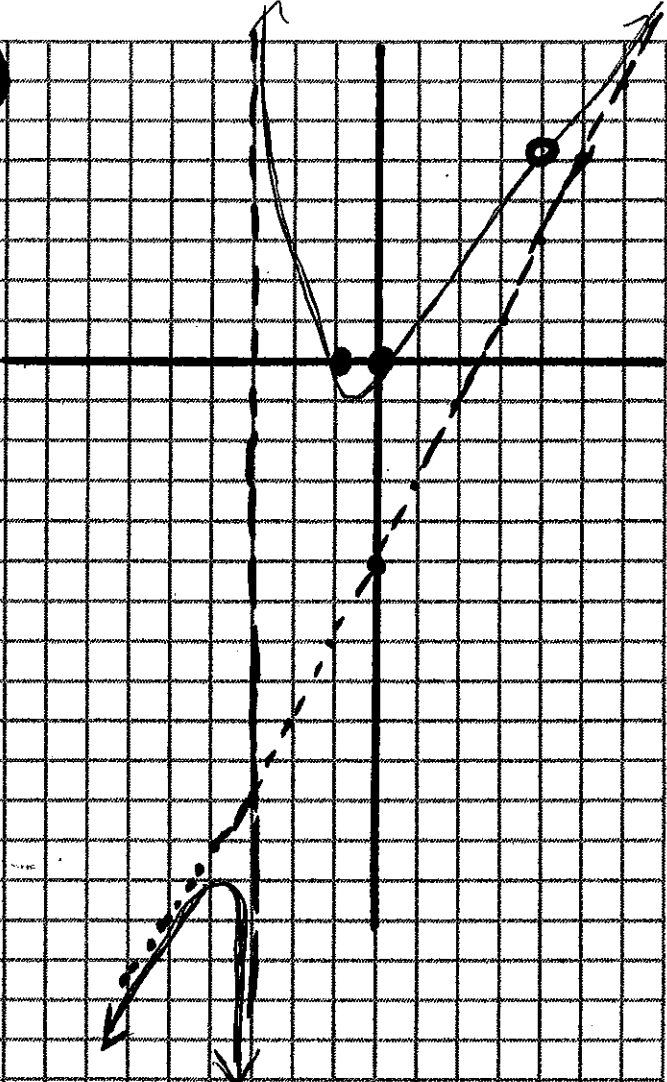
#9  $x^2 - x - 12 \overline{) 2x^3 - 7x^2 - 4x}$   
 $2x^3 - 2x^2$   
 $-5x^2 - 4x$   
 slant asymptote

#10  $x^3 \overline{) x^4 + 0x^3 - 10x^2 + 0x + 9}$   
 $x^4 + 0x^3$   
 $0x^3 \dots$   
 slant asymptote

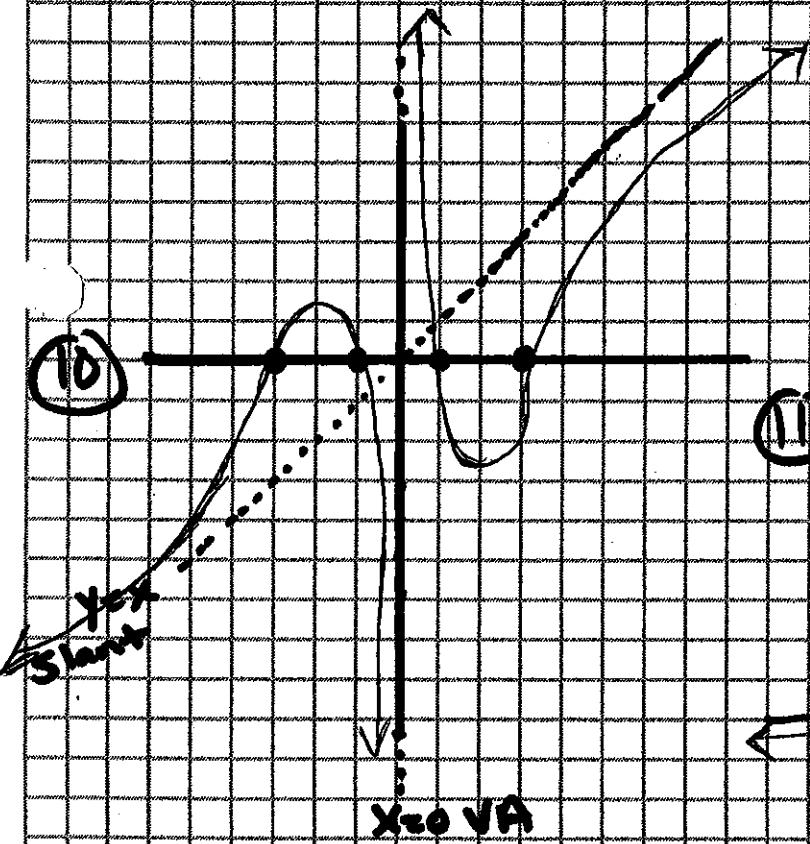
8



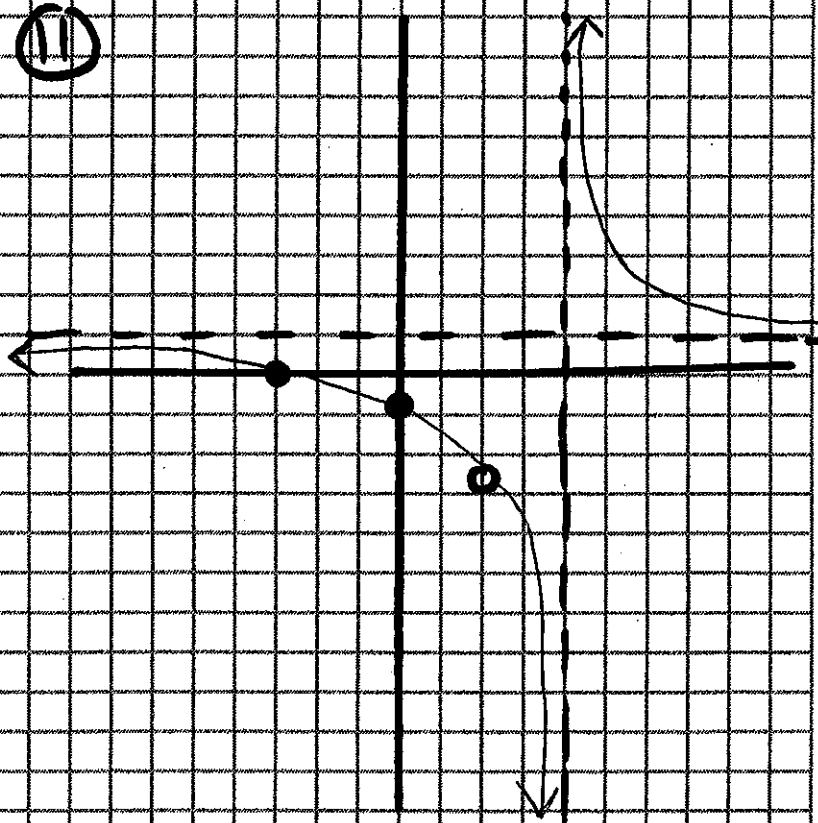
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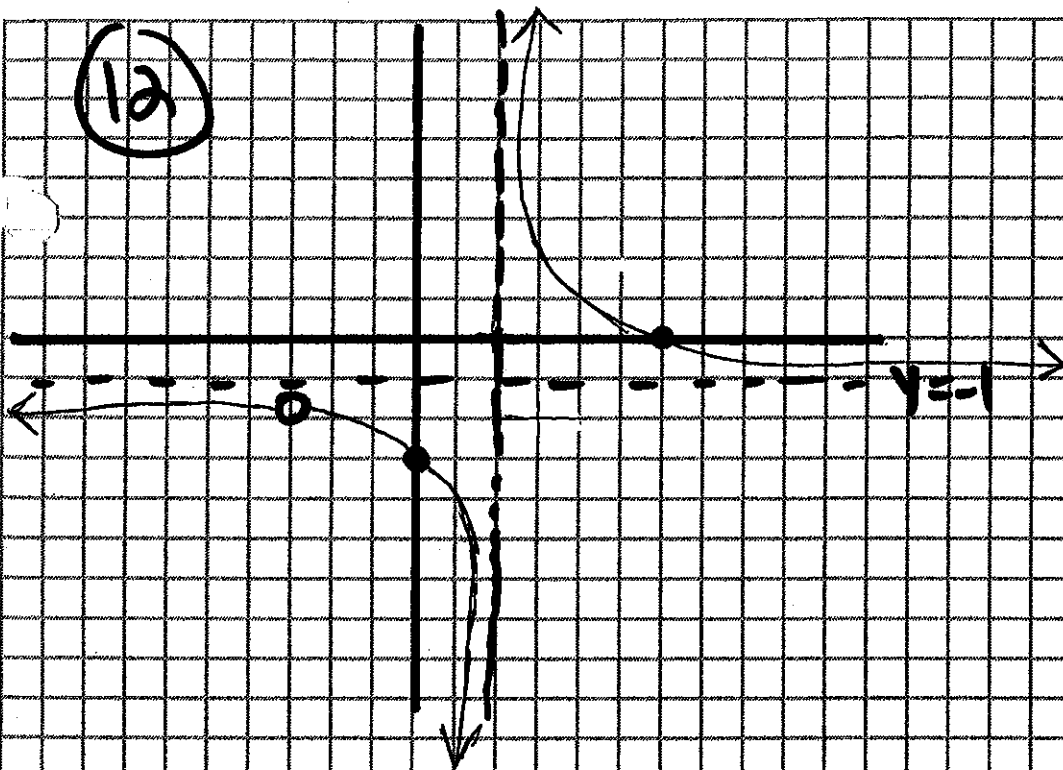


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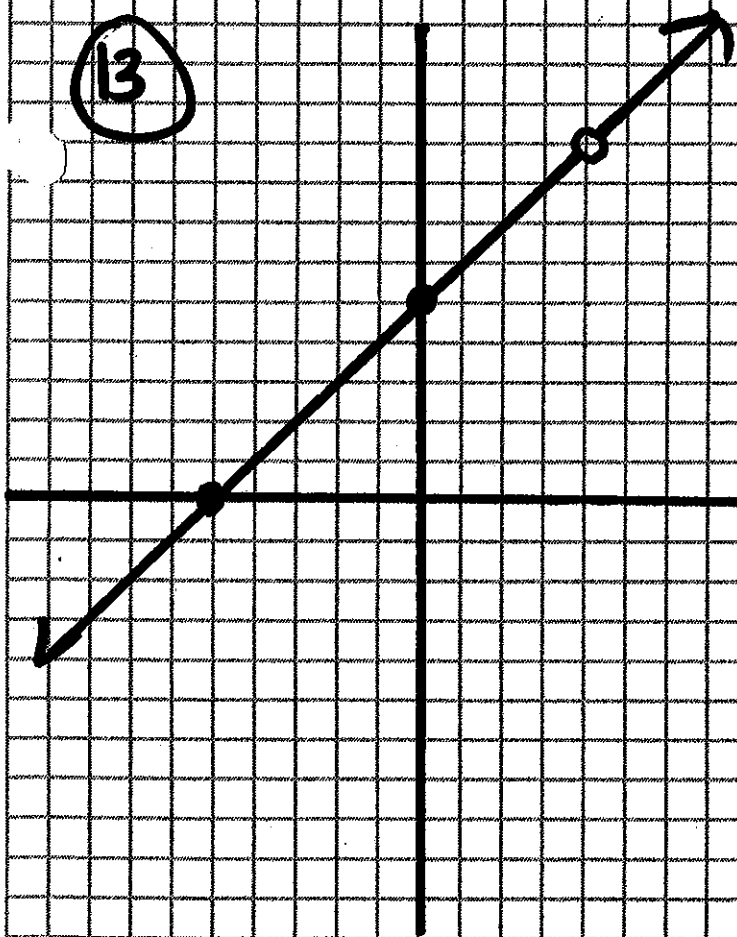


\* Remember... it's o.k. to cross through the slant asymptote. It only affects the END behavior.

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13



This is a linear function  
 $y = x + 5$   
with a hole  
There are no asymptotes