

Alg. 2

Name

Date

Hour

9.2

Graphing Rational Functions

Identify the vertical asymptote, horizontal asymptote, domain, and range of each.

1) $y = \frac{4}{(x-2)} + 1$ (2, 1)

D: $\mathbb{R} \ x \neq 2$ V.A.: $x=2$

R: $\mathbb{R} \ y \neq 1$ H.A.: $y=1$

2) $y = \frac{2}{(x+4)} - 5$ (-4, -5)

D: $\mathbb{R} \ x \neq -4$ V.A.: $x=-4$

R: $\mathbb{R} \ y \neq -5$ H.A.: $y=-5$

3) $y = \frac{3}{x}$ (0, 0)

D: $\mathbb{R} \ x \neq 0$ V.A.: $x=0$

R: $\mathbb{R} \ y \neq 0$ H.A.: $y=0$

4) $y = \frac{-5}{x} + 5$ (0, 5)

D: $\mathbb{R} \ x \neq 0$ V.A.: $x=0$

R: $\mathbb{R} \ y \neq 5$ H.A.: $y=5$

5) $y = \frac{5}{(x-6)} + 4$ (6, 4)

D: $\mathbb{R} \ x \neq 6$ V.A.: $x=6$

R: $\mathbb{R} \ y \neq 4$ H.A.: $y=4$

6) $y = \frac{2}{(x-4)} - 2$ (4, -2)

D: $\mathbb{R} \ x \neq 4$ V.A.: $x=4$

R: $\mathbb{R} \ y \neq -2$ H.A.: $y=-2$

7) $y = \frac{1}{x}$ (0, 0)

D: $\mathbb{R} \ x \neq 0$ V.A.: $x=0$

R: $\mathbb{R} \ y \neq 0$ H.A.: $y=0$

8) $y = \frac{-3}{(x+7)} - 1$ (-7, -1)

D: $\mathbb{R} \ x \neq -7$ V.A.: $x=-7$

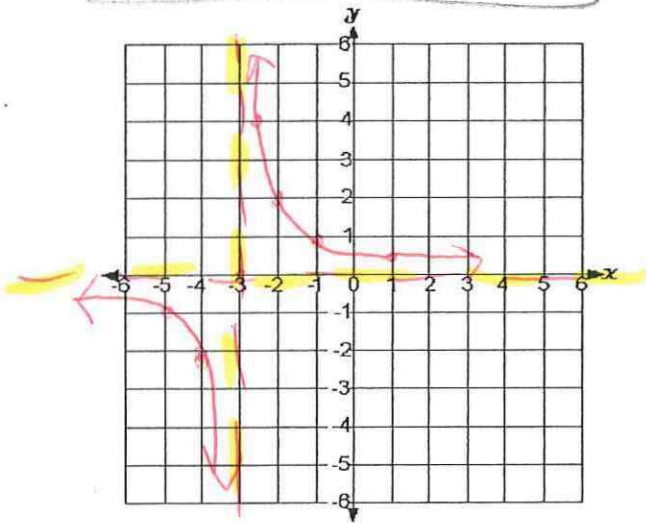
R: $\mathbb{R} \ y \neq -1$ H.A.: $y=-1$

Identify the vertical asymptote, horizontal asymptote, domain, and range of each. Then use a table of values to sketch the graph.

9) $y = \frac{2}{(x+3)}$

$(-3, 0)$ $(2, 1)$ $(1, 2)$
 $(\frac{1}{2}, 4)$ $(4, \frac{1}{2})$
 $(-2, -1)$ $(-1, -2)$

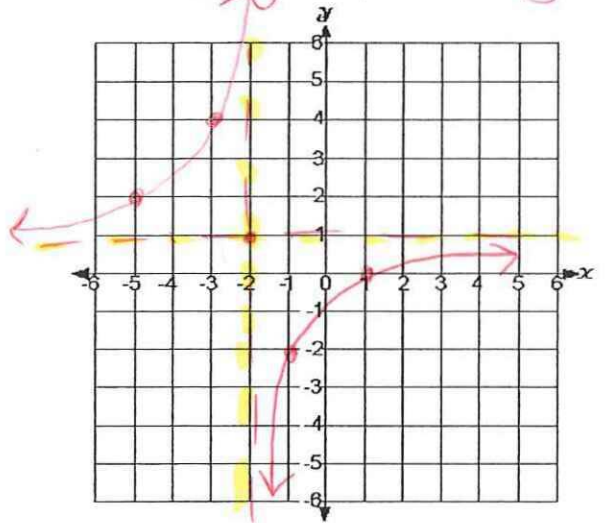
D: $\mathbb{R} \ x \neq -3$ V.A.: $x = -3$
 R: $\mathbb{R} \ y \neq 0$ H.A.: $y = 0$



10) $y = \frac{-3}{(x+2)} + 1$

$(-1, 3)$ $(3, -1)$
 $(-3, 1)$ $(1, -3)$
 $(-2, 1)$

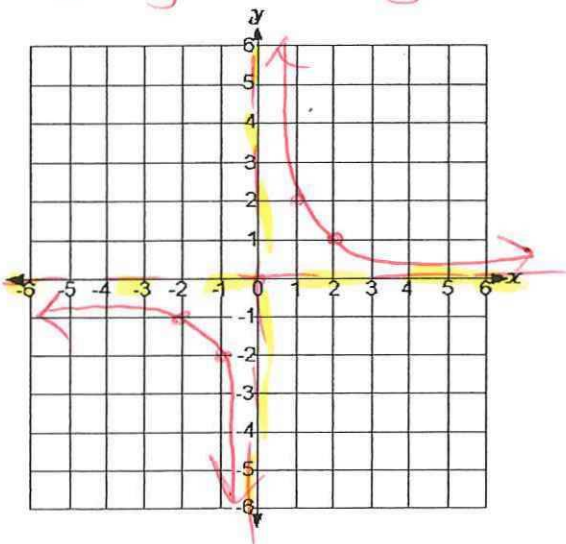
D: $\mathbb{R} \ x \neq -2$ V.A.: $x = -2$
 R: $\mathbb{R} \ y \neq 1$ H.A.: $y = 1$



11) $y = \frac{2}{x}$

$(0, 0)$ $(2, 1)$ $(1, 2)$
 $(-2, -1)$ $(-1, -2)$

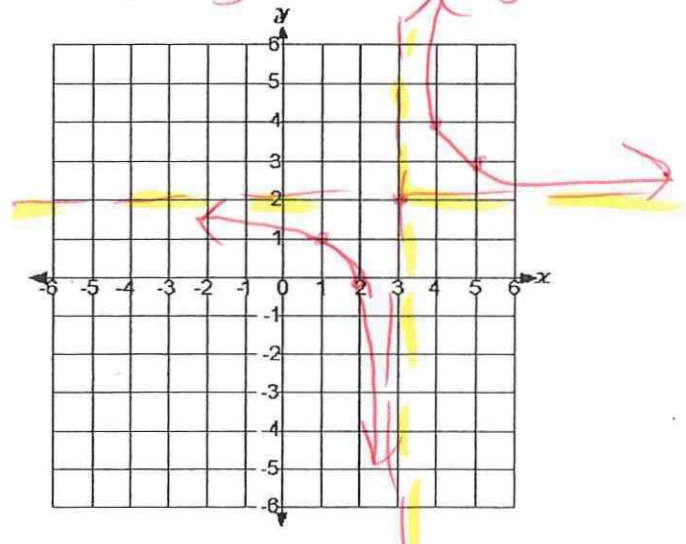
D: $\mathbb{R} \ x \neq 0$ V.A.: $x = 0$
 R: $\mathbb{R} \ y \neq 0$ H.A.: $y = 0$



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

$(2, 1)$ $(1, 2)$
 $(3, 2)$ $(-2, -1)$ $(-1, -2)$

D: $\mathbb{R} \ x \neq 3$ V.A.: $x = 3$
 R: $\mathbb{R} \ y \neq 2$ H.A.: $y = 2$

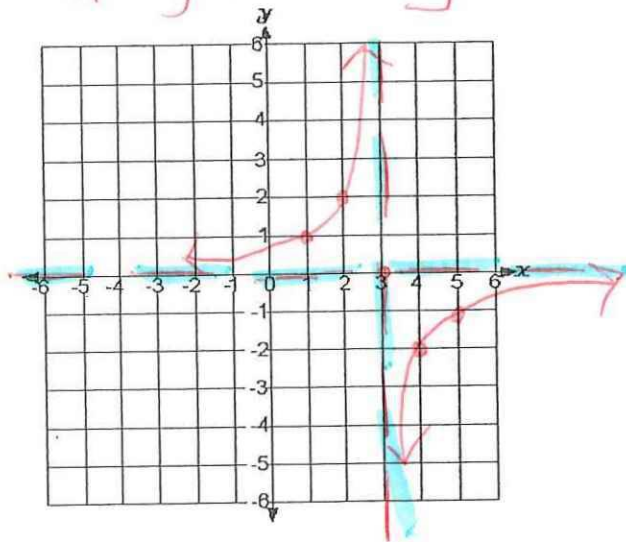


$$13) y = \frac{-2}{(x-3)}$$

(3, 0)

D: $\mathbb{R} x \neq 3$ V.A.: $x=3$

R: $\mathbb{R} y \neq 0$ H.A.: $y=0$

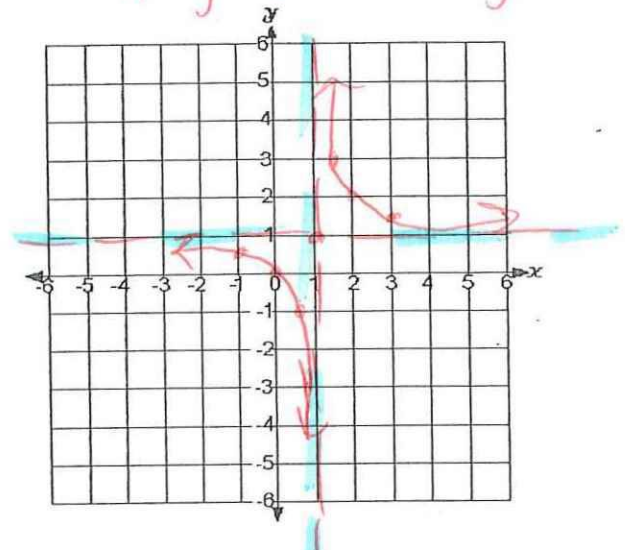


$$14) y = \frac{1}{(x-1)} + 1$$

(1, 1)

D: $\mathbb{R} x \neq 1$ V.A.: $x=1$

R: $\mathbb{R} y \neq 1$ H.A.: $y=1$



$$15) y = \frac{2}{(x+2)} - 1$$

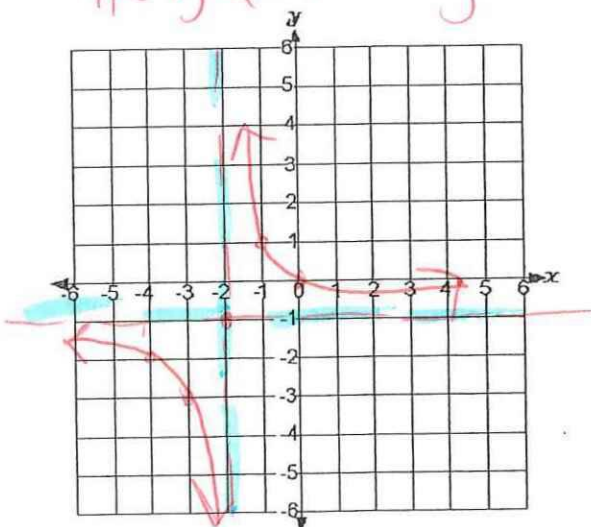
(-2, -1)

+a
+/-

-a
+/-

D: $\mathbb{R} x \neq -2$ V.A.: $x=-2$

R: $\mathbb{R} y \neq -1$ H.A.: $y=-1$

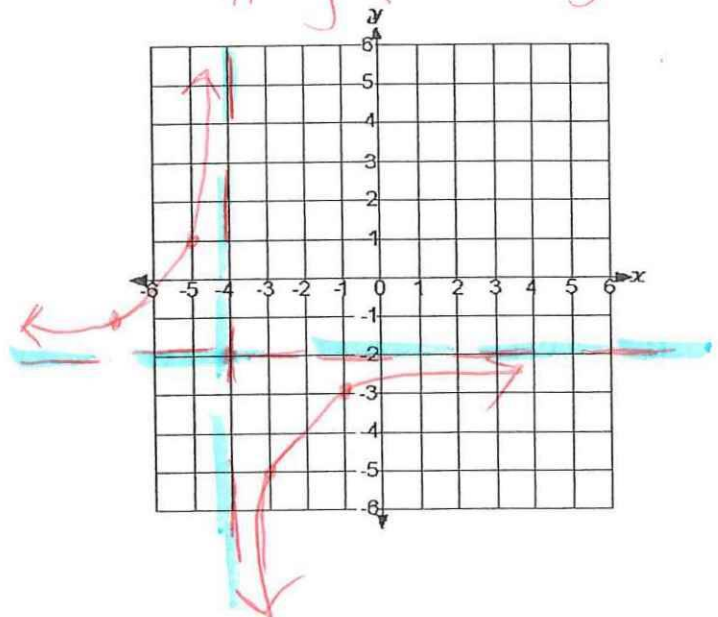


$$16) y = \frac{-3}{(x+4)} - 2$$

(-4, -2)

D: $\mathbb{R} x \neq -4$ V.A.: $x=-4$

R: $\mathbb{R} y \neq -2$ H.A.: $y=-2$

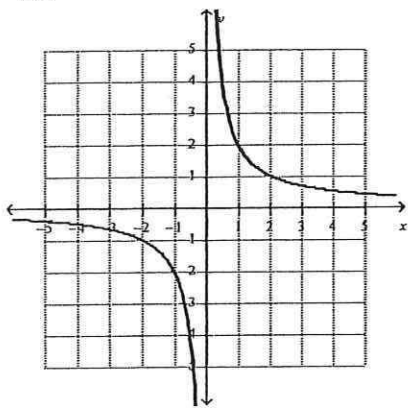


17) Draw in the asymptotes of each graph.

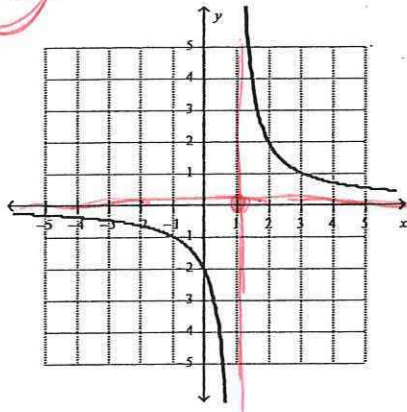
Then determine which one matches the equation $y = \frac{2}{(x-1)}$

(1, 0)

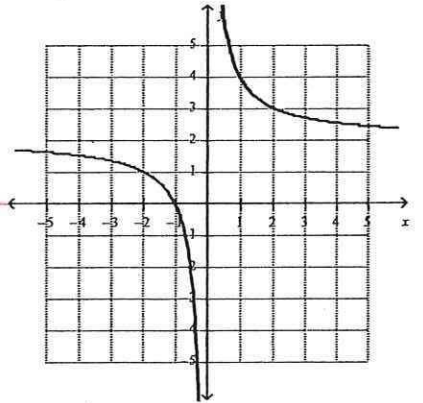
A.



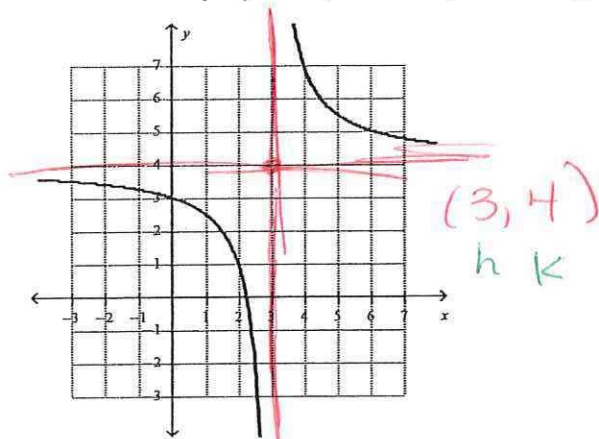
B.



C.



18) Draw in the asymptotes of the graph. Then identify the vertical asymptote, horizontal asymptote, domain, and range.

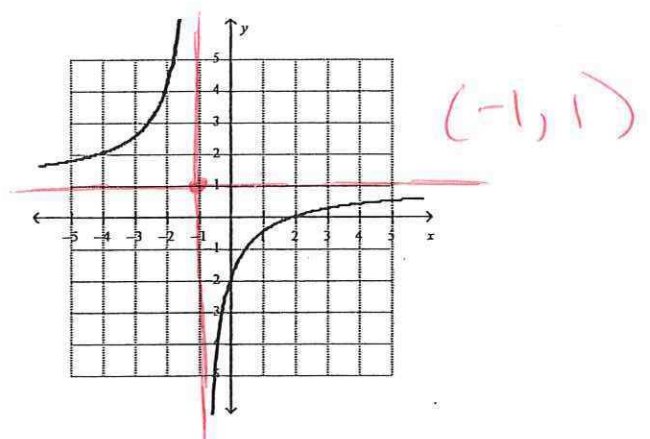


Domain: $\mathbb{R} \ x \neq 3$

Range: $\mathbb{R} \ y \neq 4$

V. Asymptote: $x = 3$

H. Asymptote: $y = 4$



Domain: $\mathbb{R} \ x \neq -1$

Range: $\mathbb{R} \ y \neq 1$

V. Asymptote: $x = -1$

H. Asymptote: $y = 1$

19) What is the vertical asymptote of

the function $y = \frac{2}{(x+3)} - 4$?

A. $x = 4$

B. $x = -4$

C. $x = 1$

D. $x = -3$

(-3, -4)

20) What is the range of the

function $y = \frac{4}{(x+3)} - 5$?

A. all real numbers except $y \neq -3$

B. all real numbers except $y \neq 3$

C. all real numbers except $y \neq -5$

D. all real numbers except $y \neq -4$

(-3, -5)