

Name: \_\_\_\_\_

Show work needed to justify your answer.

Date: \_\_\_\_\_

HW: # 16a: Math IBSL - Standard 16 -Rational Functions [  $f(x) = \frac{ax+b}{cx+d}$  ]

5 points

7 Find the inverse of each function.

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

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

$$y+3 = x(y-2)$$

$$y+3 = xy - 2x$$

$$2x+3 = xy - y$$

$$2x+3 = y(x-1)$$

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

c  $f(x) = \frac{1+7x}{9-x}$

$$x = \frac{1+7y}{9-y}$$

$$1+7y = x(9-y)$$

$$1+7y = 9x - xy$$

$$7y + xy = 9x - 1$$

$$y(7+x) = 9x - 1$$

$$f^{-1}(x) = \frac{9x-1}{7+x}$$

10 Let  $f(x) = m + \frac{6}{x-n}$ . The line  $x=5$  is anasymptote to the graph of  $f$ .a Write down the value of  $n$ .The graph passes through the point  $(7, 7)$ .b Find the value of  $m$ .

c Write down the equation of the horizontal asymptote.

a)  $n=5$

b)  $7 = m + \frac{6}{7-5}$

$$7 = m + 3$$

$$m=4$$

c)  $f(x) = \frac{6}{x-5} + \frac{4}{1} \frac{(x-5)}{(x-5)}$

$$f(x) = \frac{6+4x-20}{x-5}$$

$$f(x) = \frac{4x-14}{x-5}$$

H.A.:  $y=4$

Name: \_\_\_\_\_

Show work needed to justify your answer.

Date: \_\_\_\_\_

HW: # 16a: Math IBSL - Standard 16 -Rational Functions [  $f(x) = (ax+b)/(cx+d)$  ]

5 points



11 Consider the function  $y = \frac{4}{x-2} + 3$ .

- Write down the equation of the horizontal asymptote.
- Find the vertical asymptote.
- Find the coordinates of the axial intercepts.

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

$$y = \frac{3x-2}{x-2}$$

H.A:  $y = 3$

b) V.A.  $x = 2$

c)  $x$ -int ( $y=0$ ) |  $y$ -int ( $x=0$ )

$$0 = 3x - 2$$

$$x = \frac{2}{3}$$

$$y = 1$$

13  $f(x) = \frac{x+2}{x+3}$  and  $g(x) = \frac{1}{x}$ .

- Find  $(g \circ f)(x)$ .
- Plot  $(g \circ f)(x)$  and  $f(x)$  on your GDC, and use this to solve  $f(x) = (g \circ f)(x)$ .

a)  $g(f(x)) = g\left(\frac{x+2}{x+3}\right)$

$$= \frac{1}{\left(\frac{x+2}{x+3}\right)}$$

$$g(f(x)) = \frac{x+3}{x+2}$$

b)  $x = -2.5$

$$(x+2)^2 = (x+3)^2$$
$$x^2 + 4x + 4 = x^2 + 6x + 9$$

$$-5 = \frac{2}{2}x$$

$$x = -2.5$$