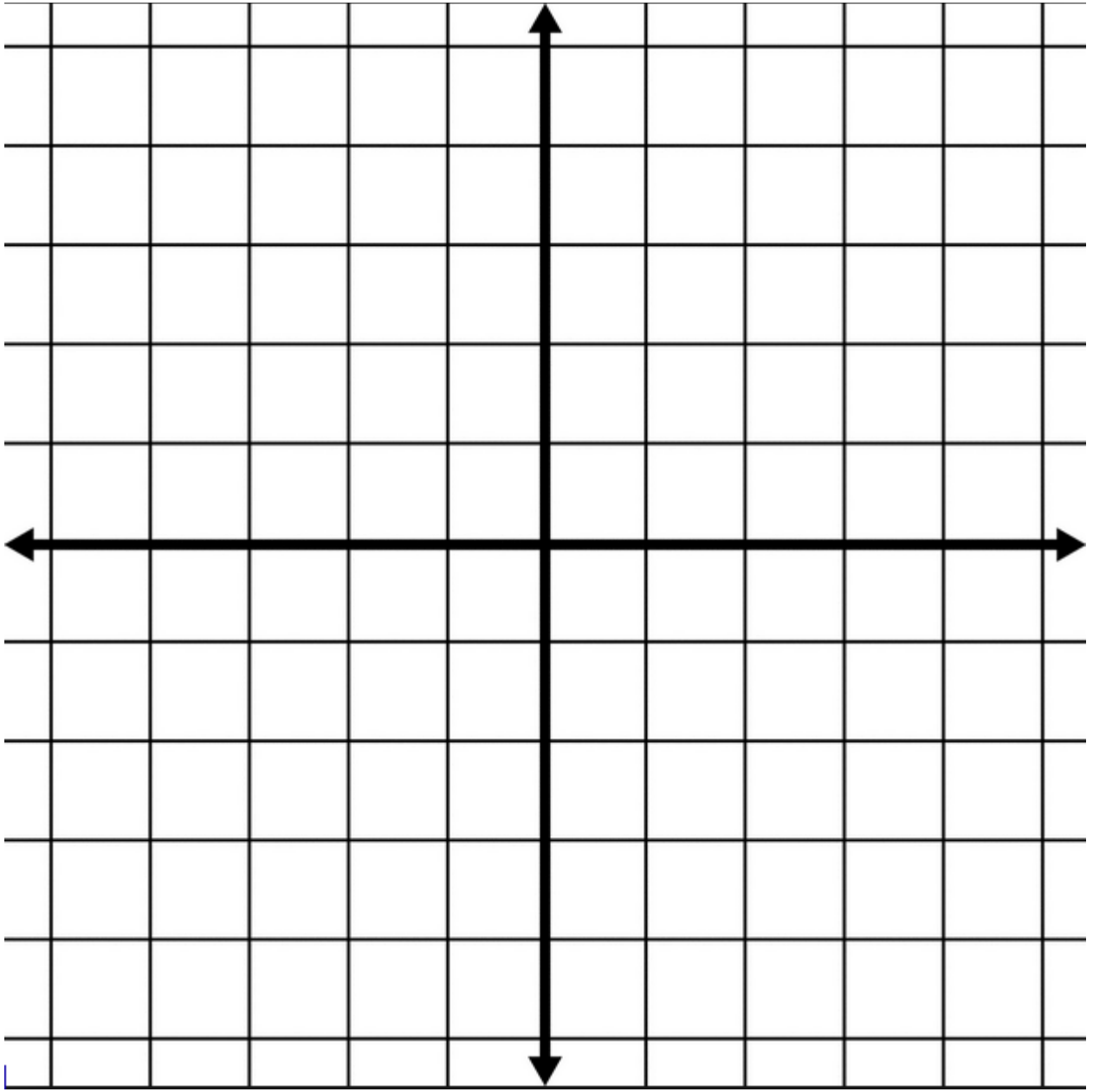
MATH 1314

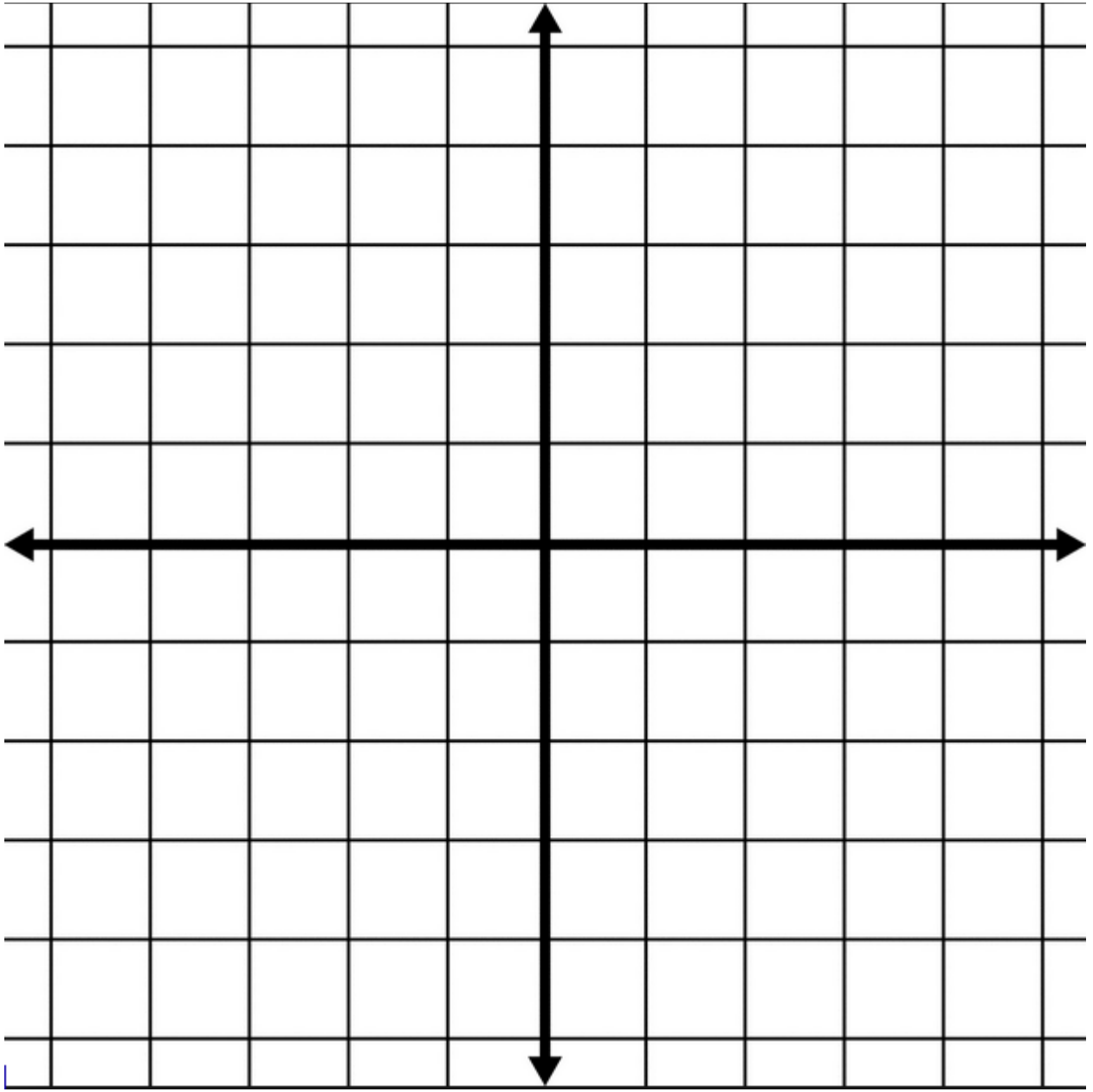
Test 4 Review

18 Multiple Choice

1. **Sketch the graph of $P(x) = -2x(x+1)(3-x)^3$**



2. Sketch the graph of $P(x) = (x-3)^2(x+2)^2$



3. **Find the quotient and remainder for** $\dfrac{2x^3 - 13x^2 - 10x + 19}{2x + 3}$

4. **Find the quotient and remainder for** $\dfrac{x^3 - 2x + 12}{x - 4}$

5. **Find the zeros:**

a. $P(x) = (x-2)^3(x^2-2x-8)$

b. $P(x) = 4x^3+4x^2-x-1$

c. $P(x) = x^3+x^2+9x+9$

6. 3^{rd} degree polynomial with integer coefficient given 1, 6i and $-6i$ with a constant coefficient of 72.

7. Use for questions a and b: $f(x) = \frac{x-4}{x+2}$

a. Find the x-intercept.

b. Find the y-intercept.

8. Find the x and y intercepts, and horizontal asymptotes in the function:

$$f(x) = \frac{x^2 + x - 6}{2x^2 - 2x - 4}$$

9. Find the vertical asymptote(s) and hole(s) for

$$f(x) = \frac{x^2 + 8x + 12}{x^2 + x - 30}$$

10. State the following and clearly label the graph.

a. x-intercepts

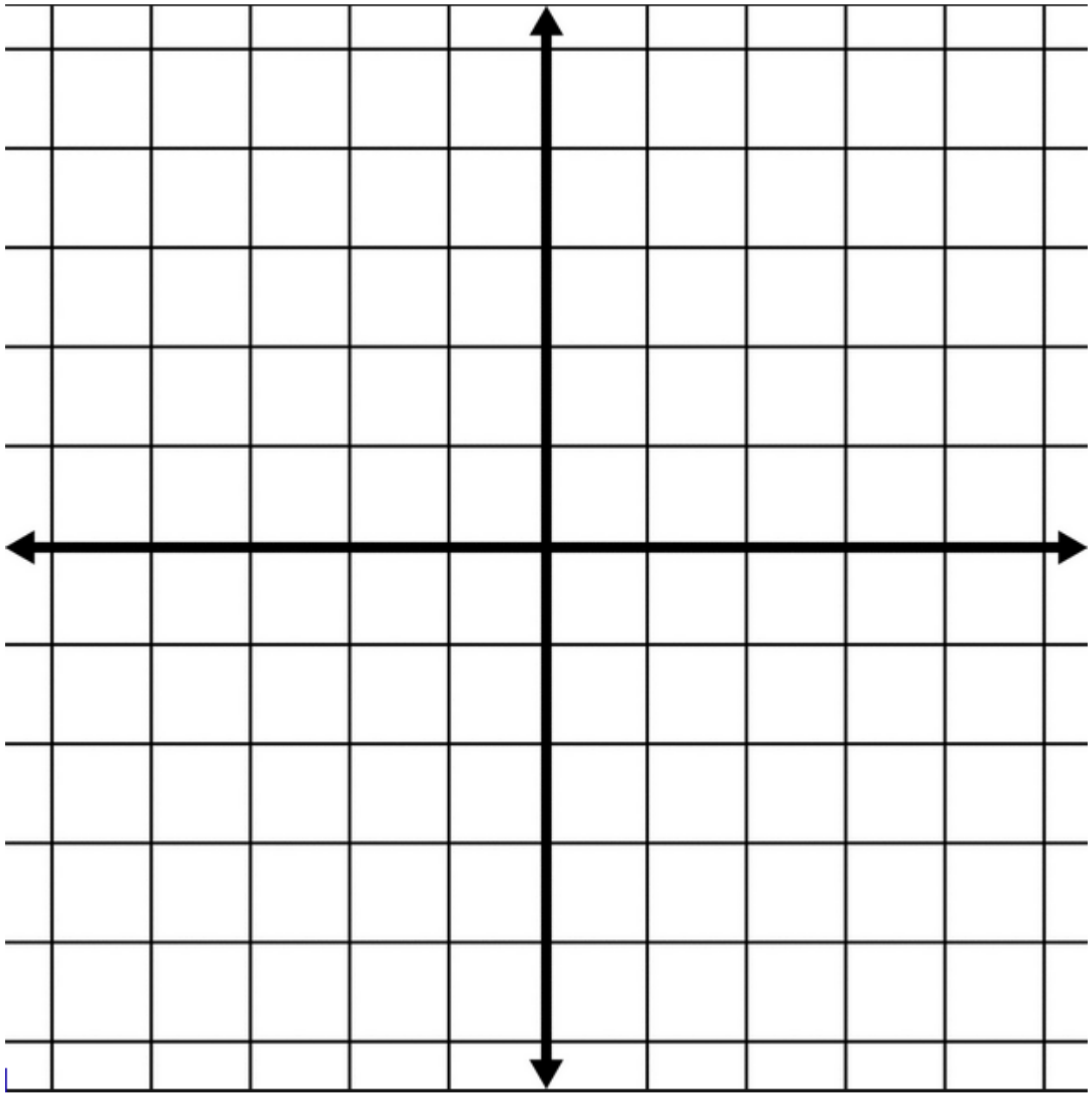
b. hole(s)

c. y-intercepts

d. vertical asymptotes

e. horizontal asymptotes

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



11. Find the exponential function of the form $f(x) = a^x$ which passes through the point (0, 1) and (2, 25).

12. Given $f(x) = 3^{x-2} + 2$

a. Use transformations to determine the coordinates of key point (0, 1).

b. Asymptote?

c. Range

13. Given $f(x) = -e^{x+1}$

a. Use the transformations to determine the coordinate of (0, 1).

b. Asymptote?

c. Range?

14. Find the y intercept for the following functions:

a. $f(x) = 4^{x+2} - 6$

b. $f(x) = -e^{x} - 2$

15. Write as an exponential function:

a. $\log_3 x = y$

b. $\ln 4 = y$

c. $\log 100 = 2$

16. Write in the logarithmic form:

a. $e^2 = x$

b. $3^3 = 27$

c. $5^{-2} = \frac{1}{25}$

17. Evaluate

a. $\log_2 4$

b. $\log_2 \sqrt{2}$

c. $\log_{4} \frac{1}{16}$

d. $\ln(-3)$

e. $2^{\log_2 6}$

f. $\log_4 1$

g. $\log_4 4$

h. $e^{\ln 4}$

i. $\log 0.01$

j. $\log_{1/2} \left(\frac{1}{2}\right)^8$

k. $\log_6 6^{-3}$

m. $9^{\log_9(-2)}$

18. Given $f(x) = \log_2(x+2) - 1$

a. Use the transformations to determine the coordinate of (1,0).

b. Asymptote?

c. Range?

d. Domain?

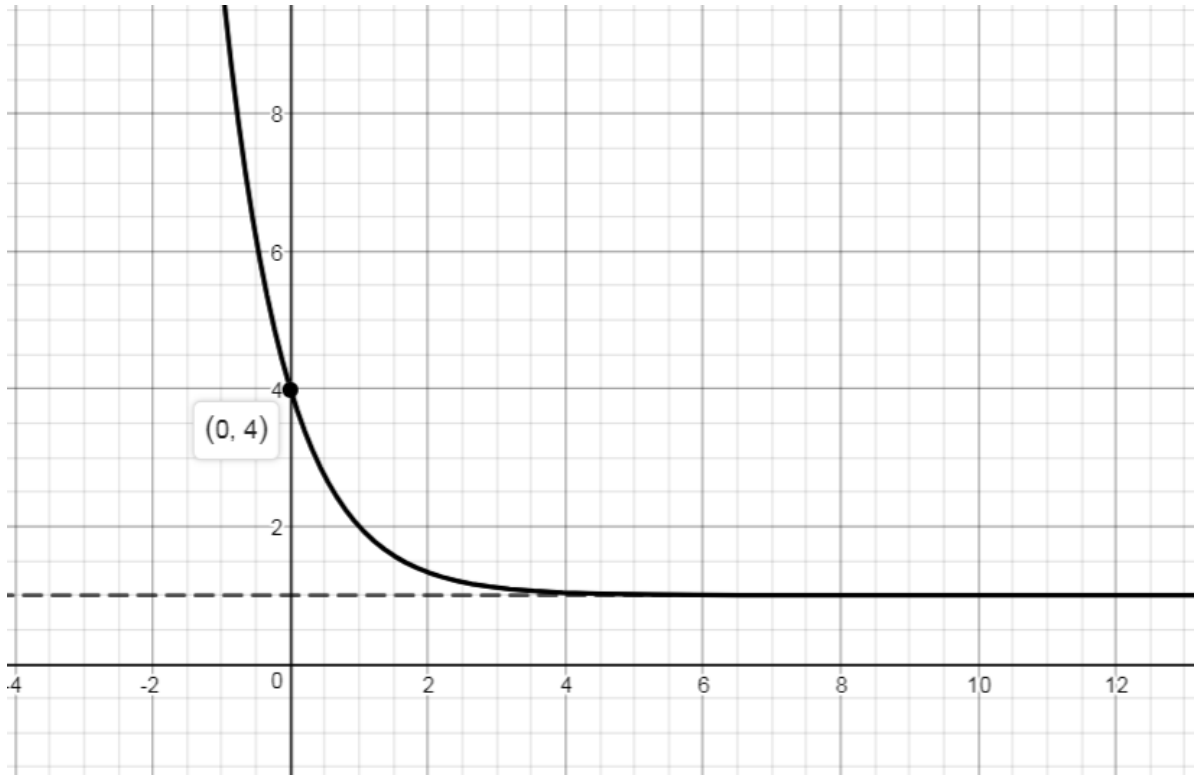
19. Find the domain:

a. $f(x) = \ln(2 - x) - 2$

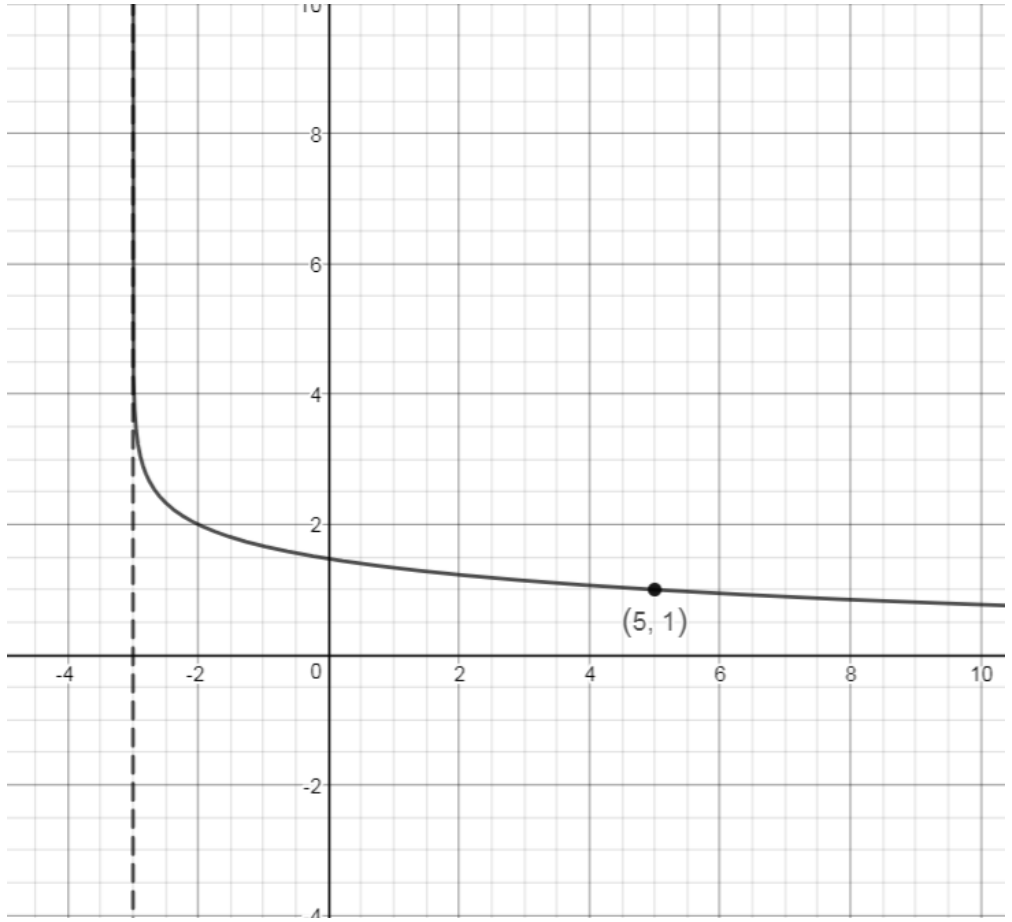
b. $f(x) = \log_3(2x + 4) - 2$

20. The polynomial $p(x) = x^3 - 7x^2 + 7x + 15$ has one root at $x = 5$. Determine the value of all roots.

21. Determine the exponential equation of the following graph [in base 3]:



22. Determine the equation of the logarithmic equation of the following graph [in base 8]:



23. Which of the following is a correct function form for the indicated parent function (there may be multiple answers).

Exponential Function:

$f(x) = 2 \cdot 3^x$

$g(x) = 2 \cdot (-3)^x$

$h(x) = 2 \cdot 1^x$

$j(x) = 2 \cdot 0^x$

Logarithmic Function:

$f(x) = 2\log(3x)$

$g(x) = 2\ln(3x)$

$h(x) = 2\log_{-3}x$

$j(x) = 2\log_3 x$