

**NO CALCULATOR!**

1. Consider the function  $f(x) = \frac{x+1}{x^2-1}$ .
- Factor the denominator. What is the domain of the function?
  - Write the function in simplified form.
  - Write the equation of the vertical asymptote.
  - Write the equation of the horizontal asymptote.
  - List the removable discontinuity (AKA hole).

2. If  $f(x) = x^3 - 3x^2 - 2x + 5$  and  $g(x) = 3$ , find  $f(g(x))$ .

3. If  $f(x) = x^3 - 3x^2 - 2x + 5$  and  $h(t) = 2t$ , find  $f(h(t))$ .

4. Evaluate the following expressions:

(a)  $f(x) = \sqrt[3]{x^{-2}}$ ; find  $f(8)$

(b)  $g(x) = x^{\frac{5}{2}}$ ; find  $g(7)$

5. Use log properties to simplify: \*\*\*Recall:  $e \approx 2.7182818284590\dots$

a.  $\ln x^3$

b.  $\ln \frac{2x}{5y}$

c.  $\ln e$

d.  $e^{\ln e}$

e.  $\ln 0$

6. Find  $\sin\left(\frac{7\pi}{6}\right)$

7. Find  $\sec\left(\frac{2\pi}{3}\right)$

8. Write the equation of the line that passes through  $(6,5)$  and  $(4,7)$ .

Use **point-slope form**  $y - y_1 = m(x - x_1)$ . *Point-slope form is MUCH more useful in calculus!*

9. Simplify. No negative exponents.

$64^{\frac{1}{2}} =$

$\frac{x^2}{x^{10}} =$

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

$x^2 x^{-5} =$

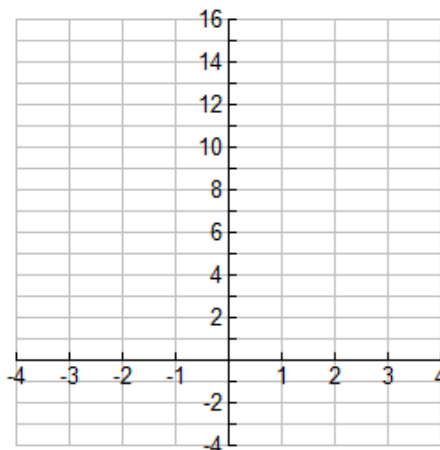
$\sqrt[4]{x^3} =$

$e^0 =$

$(2x^3)^3 =$

$\frac{1}{8} \cdot x^{-4} =$

10. Graph the following piecewise function on the below window:



$$g(x) = \begin{cases} |x|, & x < 0 \\ 3, & x = 0 \\ x^2, & x > 0 \end{cases}$$

11. Solve  $|2x-1| > 7$

12a. Explain (in words) how the graph of  $g(x) = (x-3)^2 + 4$  is related to its parent function  $f(x) = x^2$

12b. The parent function  $f(x)$  is an even function. Is  $g(x)$  an even function? Explain.

13a. Solve for  $x$ .

$$5e^{x-7} = 18$$

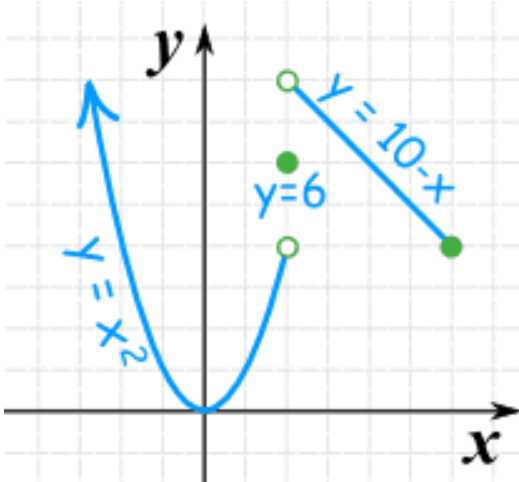
13b. Solve for  $x$ .

$$\ln(x-8) = 12$$

Given the below graph answer the following questions:

- a. What is the domain and range of the graph?
- b. When is the graph increasing? When is it decreasing?
- c. When is the graph concave up? When is it concave down?

14.

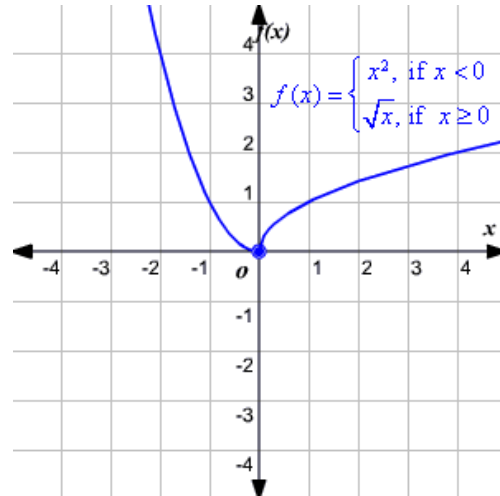


14a.

14b.

14c.

15.



15a.

15b.

15c.