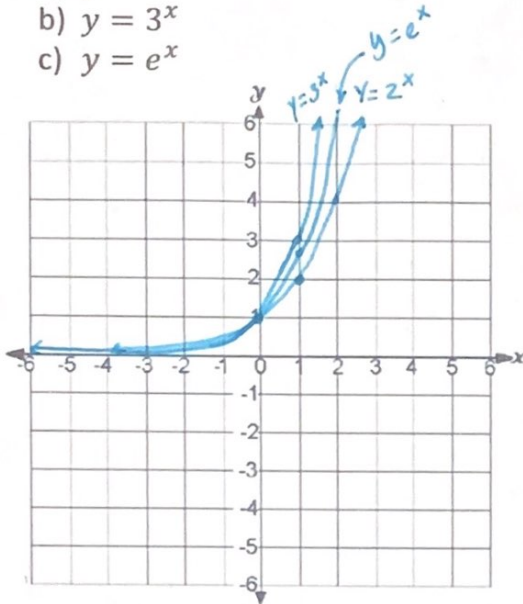


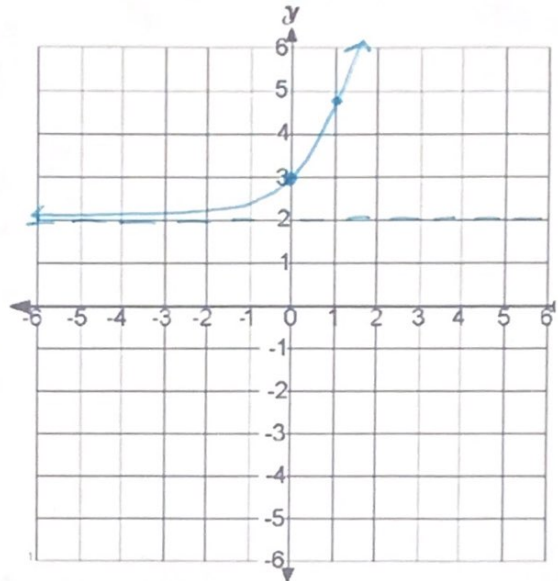
Keeper 1.2 – Domain Rules and $e \ln$ Transformations

Sketch the graphs of the following functions. \rightarrow No Calculator!

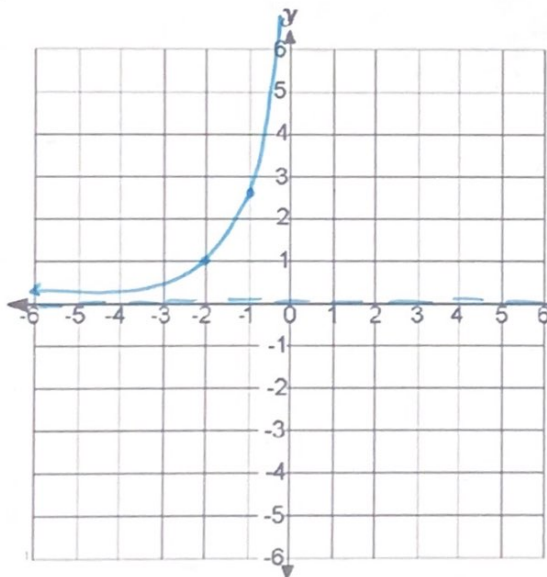
1. a) $y = 2^x$
b) $y = 3^x$
c) $y = e^x$



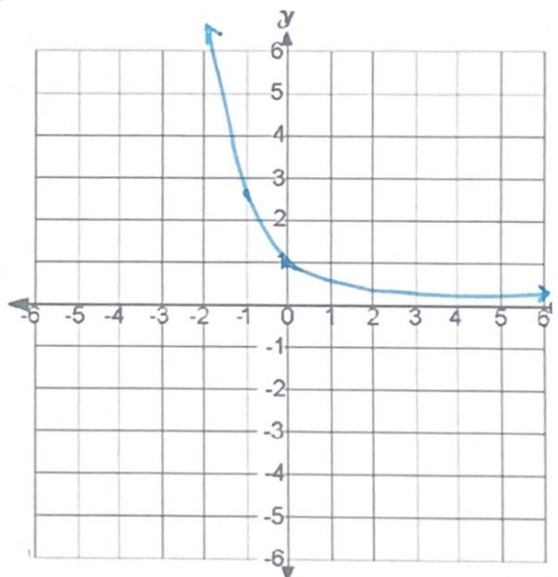
2. $y = e^x + 2$ up 2
 \rightarrow horiz Asym.



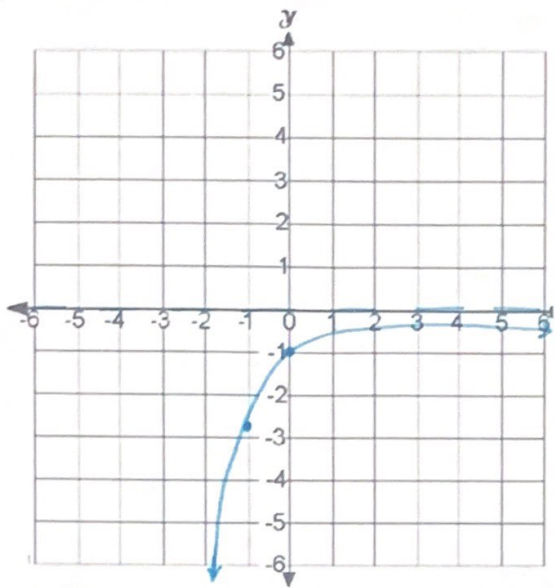
3. $y = e^{x+2}$ Left 2



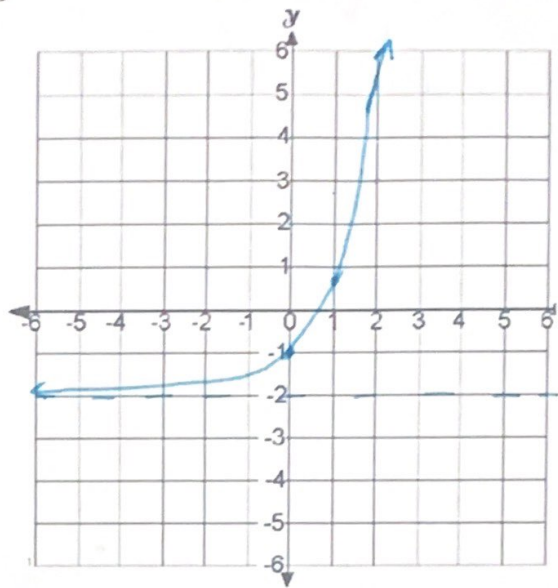
4. $y = e^{-x}$ Y axis Reflection



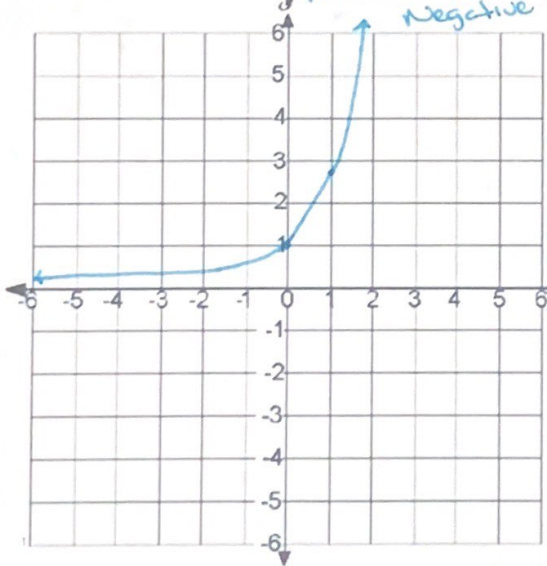
5. $y = -e^{-x}$ X and y axis reflection



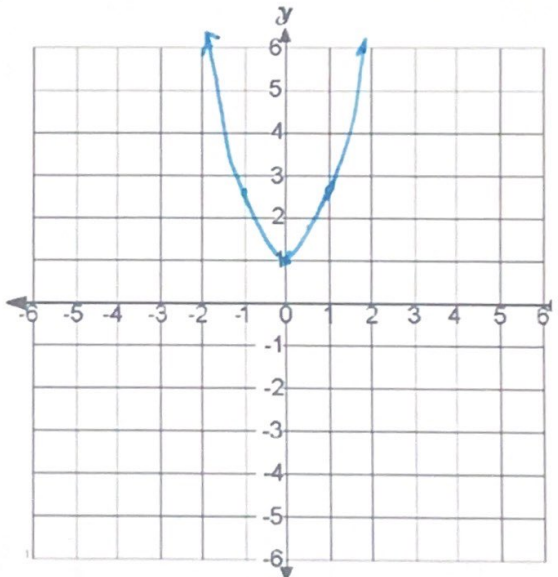
6. $y = e^x - 2$ down 2



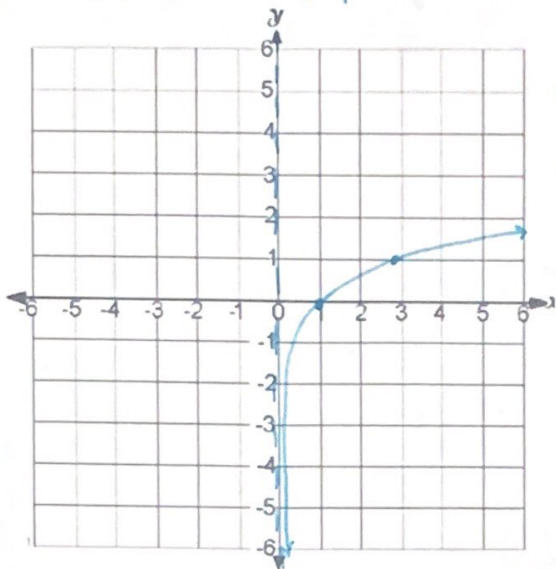
7. $y = |e^x|$ All y values become positive if negative



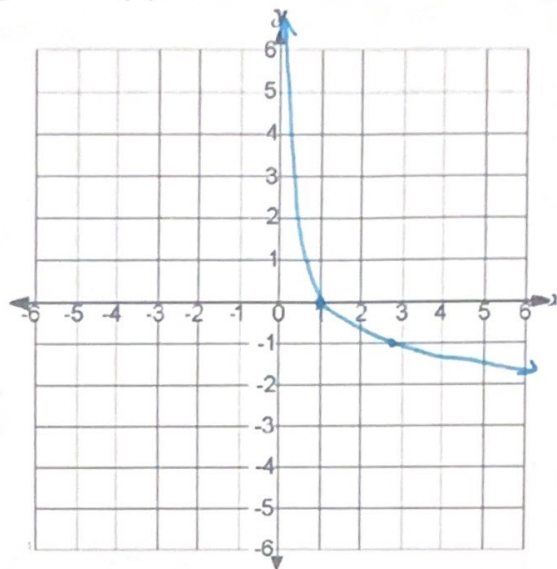
8. $y = e^{|x|}$ Negative x values mimic positive x values



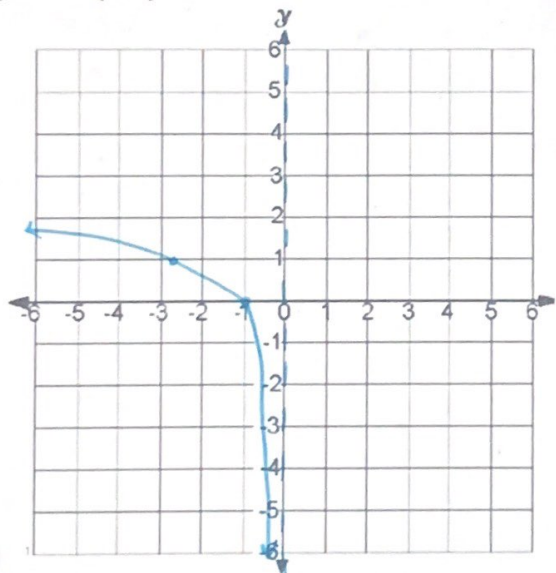
9. $y = \ln(x)$ Parent Graph



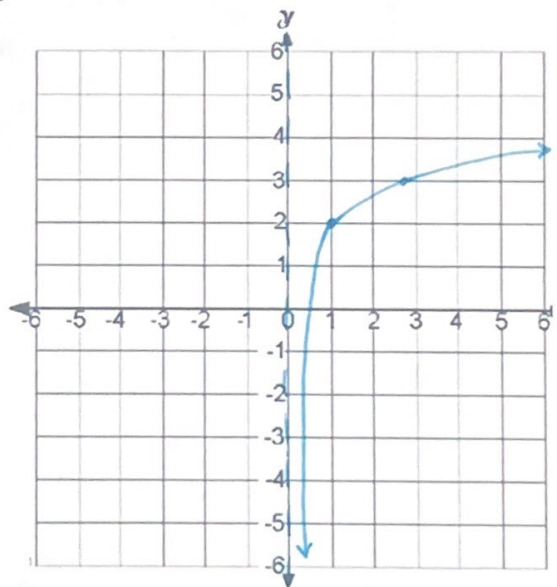
10. $y = -\ln(x)$ x axis Reflection



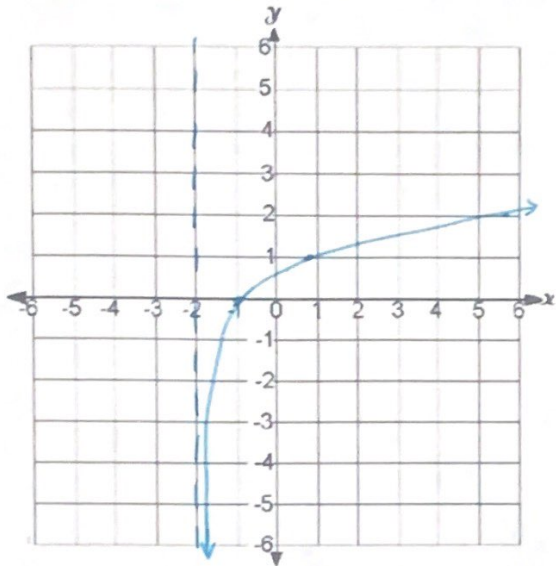
11. $y = \ln(-x)$ y axis Reflection



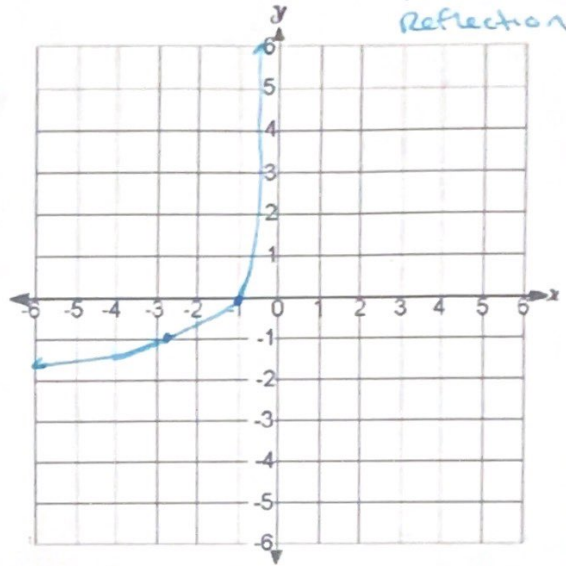
12. $y = \ln(x) + 2$ up 2



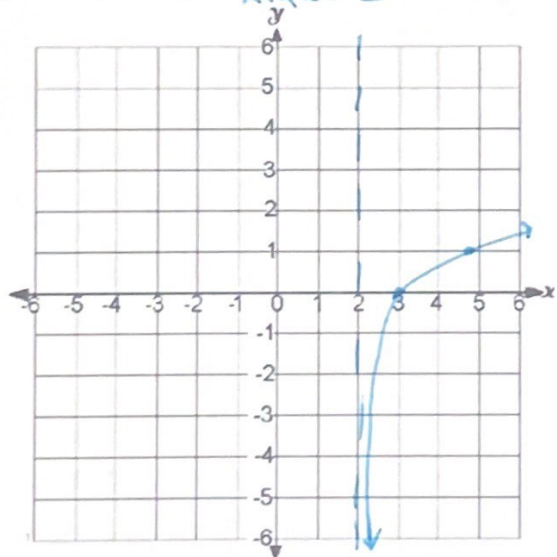
13. $y = \ln(x + 2)$ Left 2



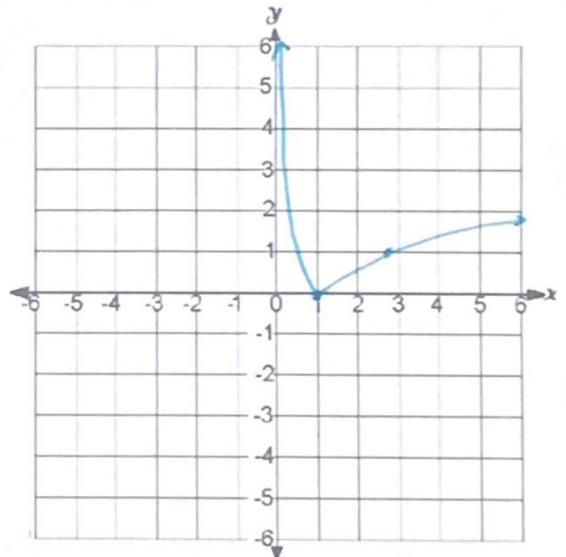
14. $y = -\ln(-x)$ x axis & y axis Reflection



15. $y = \ln(x - 2)$ Right 2



16. $y = |\ln(x)|$ All y values positive



DOMAIN

- Rational Functions: Denominator $\neq 0$
- Radical Functions – Even Index: Radicand ≥ 0
- Radical Functions – Odd Index: \mathbb{R}
- Logarithmic Functions: Argument > 0
- Trig Functions: \mathbb{R} except asymptotes

Examples: Find the Domain.

$$17. f(x) = \frac{x+2}{(x-3)(x+1)}$$

$$x \neq 3, -1$$

$$(-\infty, -1) \cup (-1, 3) \cup (3, \infty)$$

$$18. f(x) = \frac{x-3}{x^2-9}$$

$$x \neq 3, -3$$

$$(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$$

$$19. f(x) = \sqrt{x+3}$$

$$x \geq -3$$

$$[-3, \infty)$$

$$20. f(x) = \sqrt[3]{x-1}$$

$$\mathbb{R}$$

$$21. f(x) = \log(x + 2)$$

$$x + 2 > 0$$

$$x > -2$$

$$(-2, \infty)$$

$$22. f(x) = \ln(x - 1)$$

$$x - 1 > 0$$

$$x > 1$$

$$(1, \infty)$$

$$23. f(x) = \frac{3x-5}{x+1}$$

$$x \neq -1$$

$$(-\infty, -1) \cup (-1, \infty)$$

$$24. f(x) = \sqrt{\frac{3x-5}{x+1}}$$

$$x+1 \neq 0$$

$$x \neq -1$$

$$\frac{3x-5}{x+1} > 0$$

$$\begin{array}{c} + \quad - \quad + \\ -1 \quad 5/3 \end{array}$$

$$(-\infty, -1) \cup [5/3, \infty)$$

$$25. f(x) = \ln(x - 7)$$

$$x - 7 > 0$$

$$x > 7$$

$$(7, \infty)$$

$$26. f(x) = \ln\left(\frac{x}{x-1}\right)$$

$$x \neq 1$$

$$\frac{x}{x-1} > 0$$

$$\begin{array}{c} + \quad - \quad + \\ 0 \quad 1 \end{array}$$

$$(-\infty, 0) \cup (1, \infty)$$