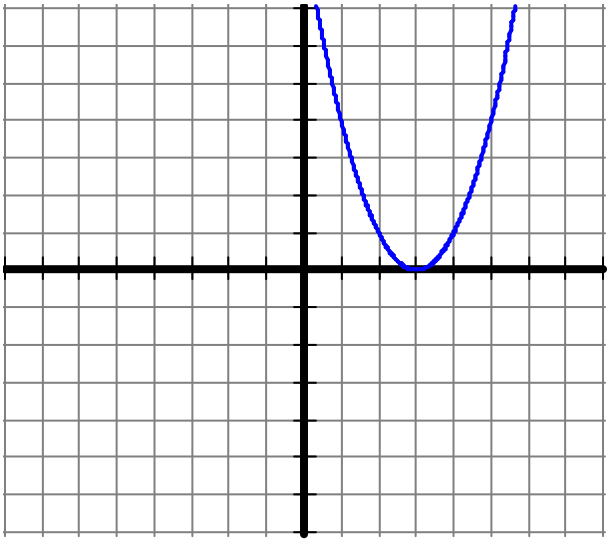
Homework 13 ANSWERS – Graphs of Translations Name:
Precalculus – Mr. Oberle

1. $y = (x-3)^2$

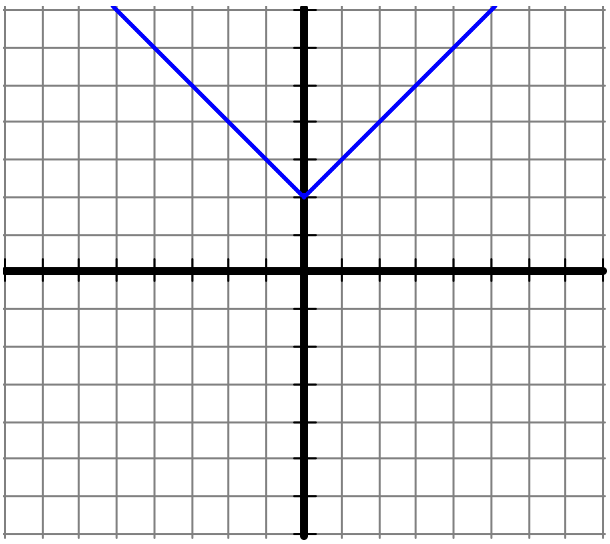


Domain: $\mathbb{R}$

Range: $y \geq 0$

Other: symmetric across $x = 3$

2. $y = |x| + 2$

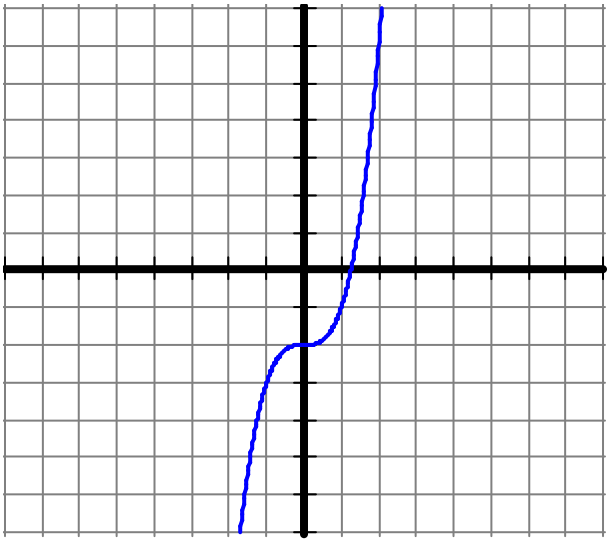


Domain: $\mathbb{R}$

Range: $y \geq 2$

Other: symmetric across $x = 0$

3. $y = x^3 - 2$

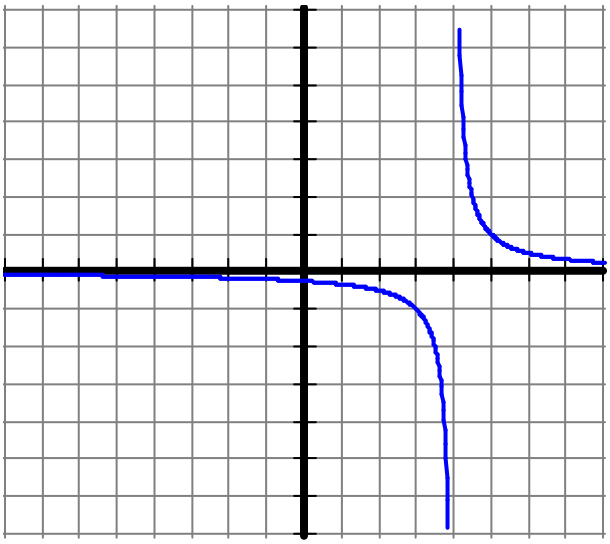


Domain: $\mathbb{R}$

Range: $\mathbb{R}$

Other: symmetric across (0, -2)

4. $y = \dfrac{1}{x-4}$

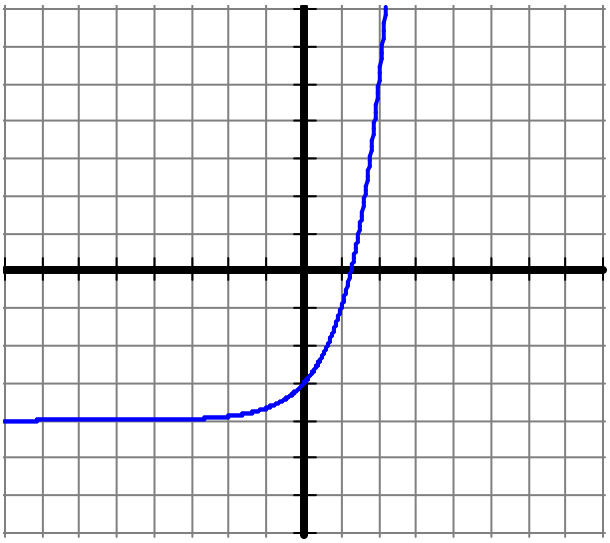


Domain: $x \neq 4$

Range: $y \neq 0$

Other: asymptotes at $x = 4, y = 0$; symmetric across (4, 0)

5. $y = 3^x - 4$

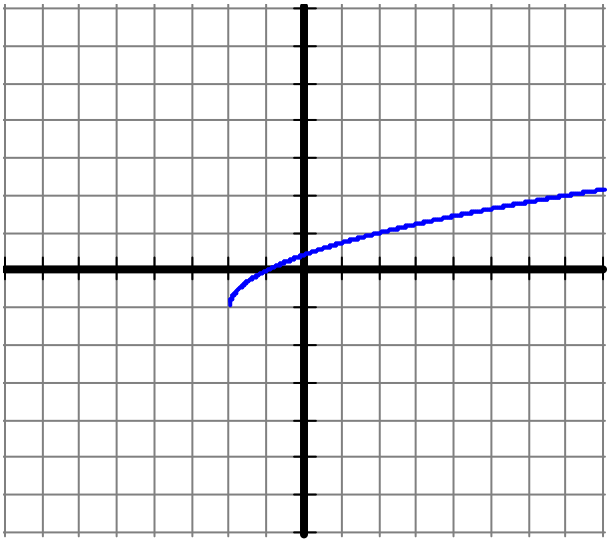


Domain: $\mathbb{R}$

Range: $y > -4$

Other: asymptote at $y = -4$

6. $y = \sqrt{x+2} - 1$

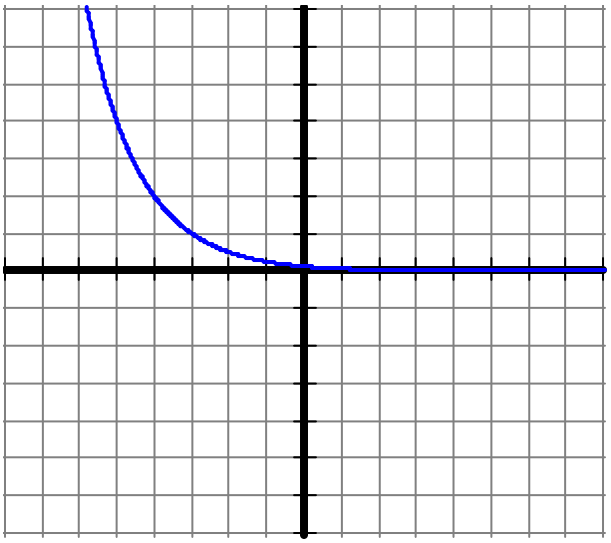


Domain: $x \geq -2$

Range: $y \geq -1$

Other: none

7. $y = \left(\frac{1}{2}\right)^{x+3}$

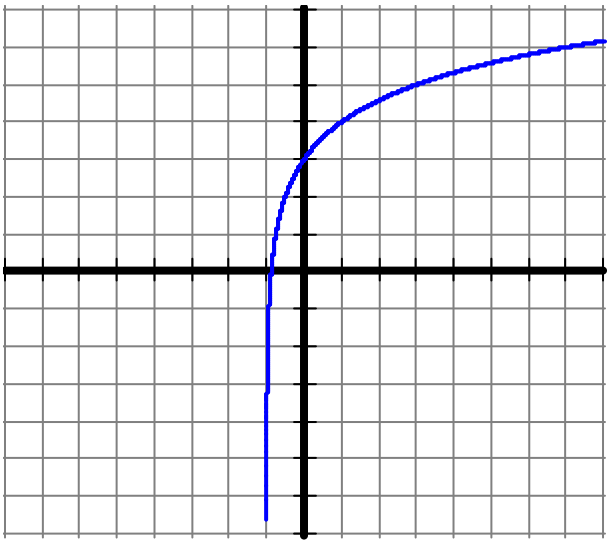


Domain: $\mathbb{R}$

Range: $y > 0$

Other: asymptote at $y = 0$

8. $y = \log_2(x+1) + 3$

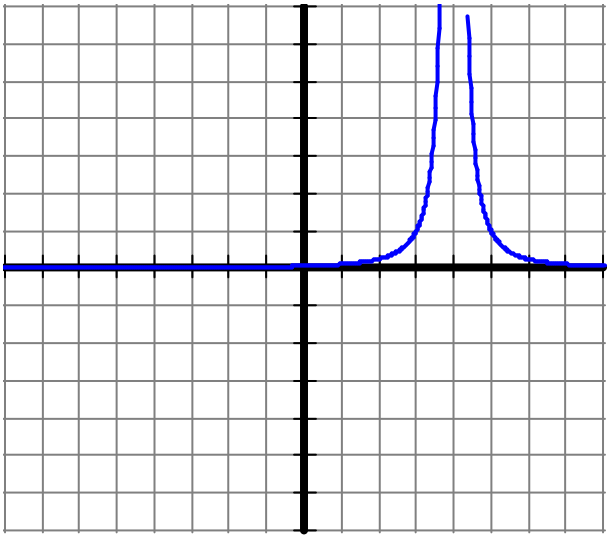


Domain: $x > -1$

Range: $\mathbb{R}$

Other: asymptote at $x = -1$

Write the formula for each of the following graphs. Describe the domain and range of the function, and find the intercepts and asymptotes when appropriate.

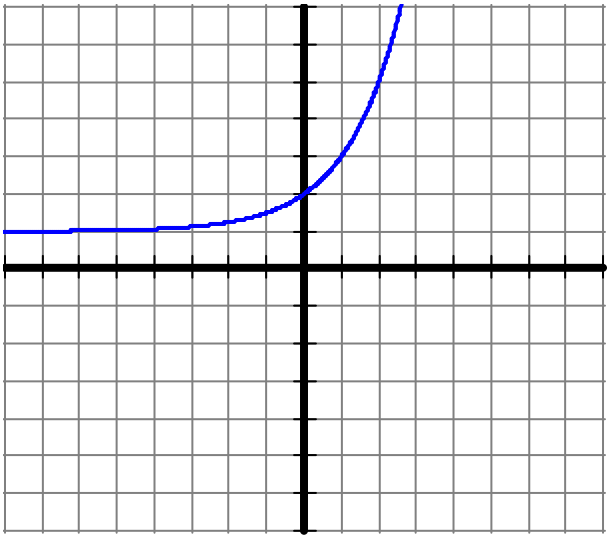


9. $y = \dfrac{1}{(x-4)^2}$

Domain: $x \neq 4$

Range: $y > 0$

Other: $x = 4, y = 0$

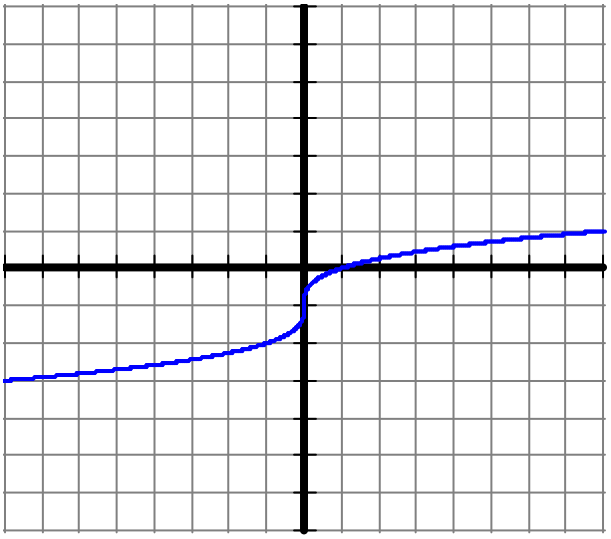


10. $y = 2^x + 1$

Domain: $\mathbb{R}$

Range: $y > 1$

Other: $y = 1$

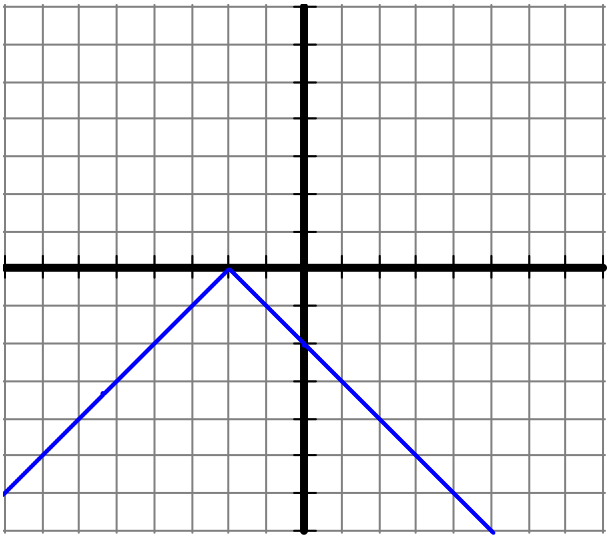


11. $y = \sqrt[3]{x} - 1$

Domain: $\mathbb{R}$

Range: $\mathbb{R}$

Other: none

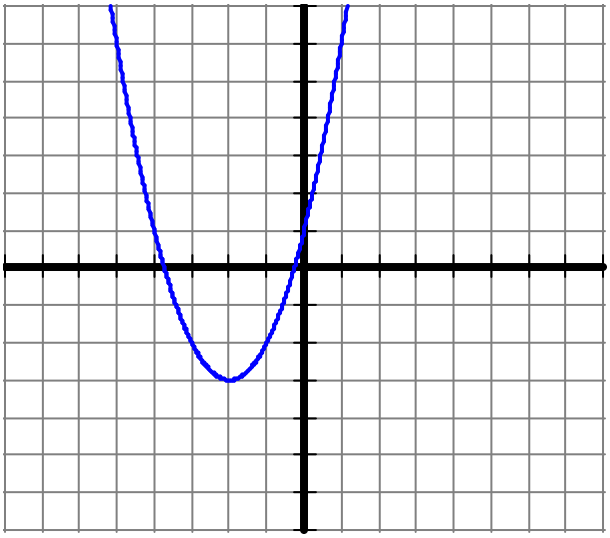


12. $y = -|x+2|$

Domain: $\mathbb{R}$

Range: $y \leq 0$

Other: none

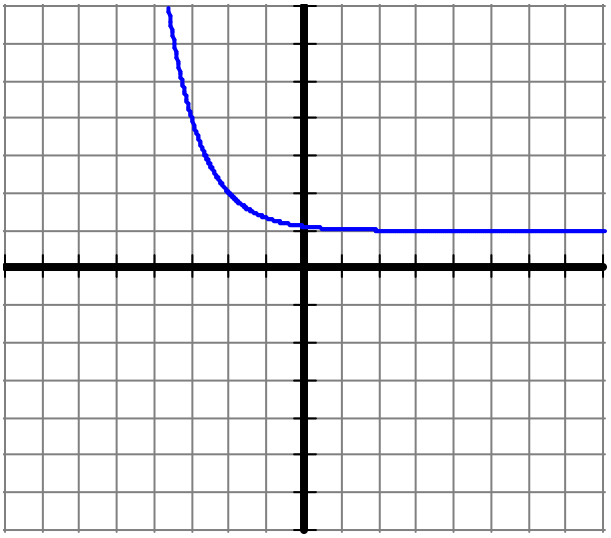


13. $y = (x+2)^2 - 3$

Domain: $\mathbb{R}$

Range: $y \geq -3$

Other: none

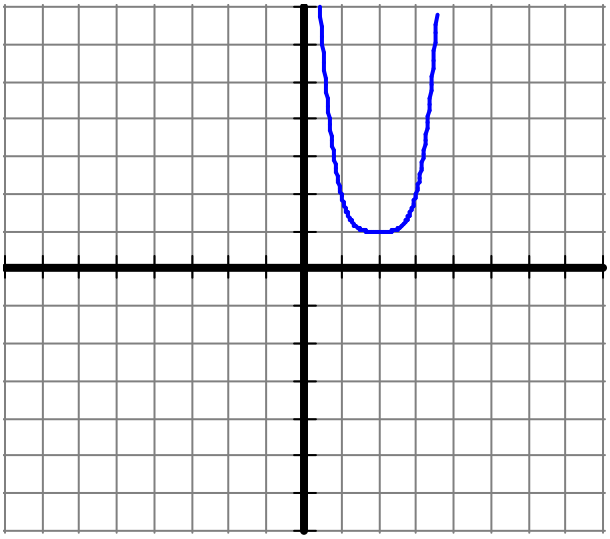


15. $y = \left(\frac{1}{3}\right)^{x+2} + 1$

Domain: $\mathbb{R}$

Range: $y > 1$

Other: $y = 1$

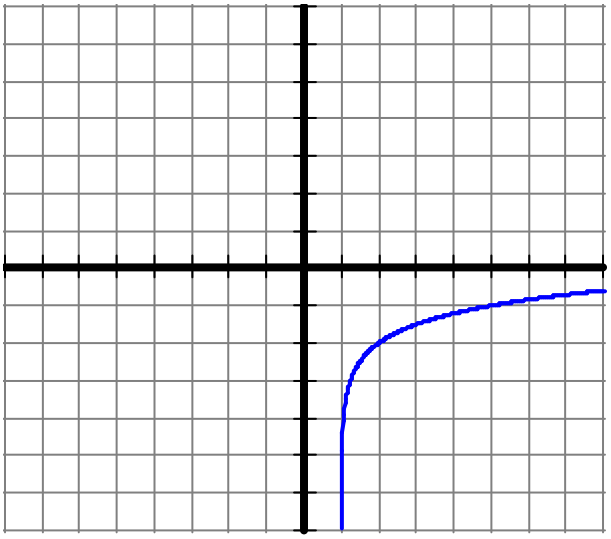


14. $y = (x-2)^4 + 1$

Domain: $\mathbb{R}$

Range: $y \geq 1$

Other: none



16. $y = \log_4(x-1) - 2$

Domain: $x > 1$

Range: $\mathbb{R}$

Other: $x = 1$