

Graphing Exponential Functions

For each function:

- Find the y-intercept, $f(0)$.
- Note whether this is growth or decay. (Growth/decay is determined by the base).
- Find the limit as $x \rightarrow \infty$
- Find the limit as $x \rightarrow -\infty$
- Sketch the function

Part A — Mild (expanded with pairing)

1. $y = 2^x$

2. $y = -4^x$

3. $y = (0.5)^x$

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

5. $y = -2^x$

Part B — Add reflections + vertical shifts

6. $y = 2^x + 3$

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

8. $y = 2^x + 4$

9. $y = 4(3)^x - 5$

10. $y = 2^{1-x} + 2$

11. $y = (0.25)^{3-x} - 3$

12. $y = 3(2)^{-x+3} - 4$

Part C — Horizontal shifts

13. $y = 2^{x-2}$

14. $y = -2^{x+1}$

15. $y = (0.5)^{x-3}$

16. $y = -(0.5)^{x+2}$

17. $4(0.5)^{-x+2} + 6$

18. $y = 3(2)^{x-1} + 5$

Part D — Spicy

19. $y = 2^{3-x} + 4$

20. $y = -2^{3-x} + 1$

21. $y = 5^{2-2x} - 1$

22. $y = -3(5)^{2-2x} - 1$

23. $y = -\frac{5}{6}\left(\frac{2}{5}\right)^{3-0.5x} + 2$