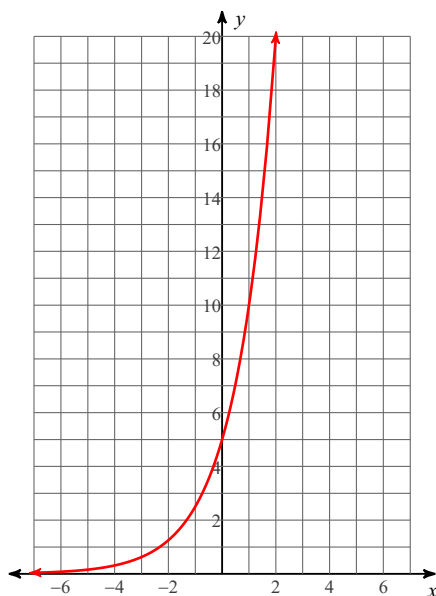


Homework 6.1 graphing

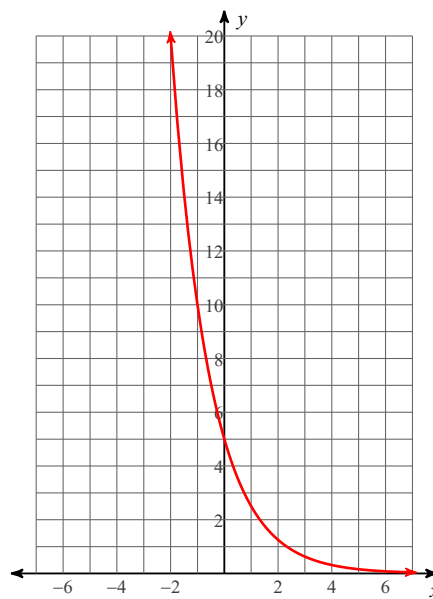
Date _____ Period _____

Sketch the graph of each function. Find the domain, range, asymptote, y intercept and end behavior.

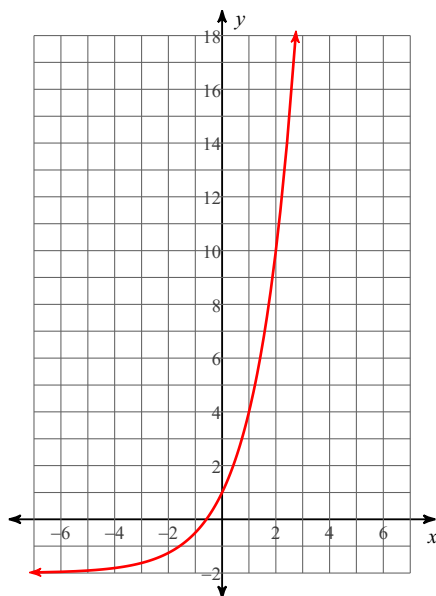
1) $y = 5 \cdot 2^x$



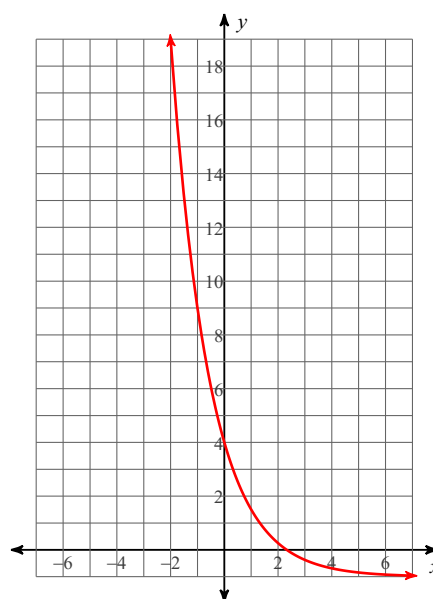
2) $y = 5 \cdot \left(\frac{1}{2}\right)^x$



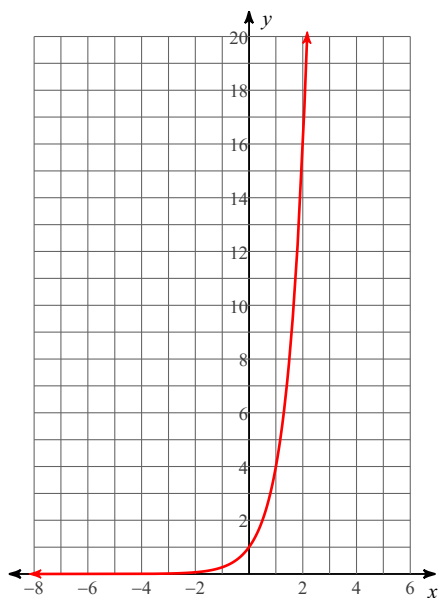
3) $y = 3 \cdot 2^x - 2$



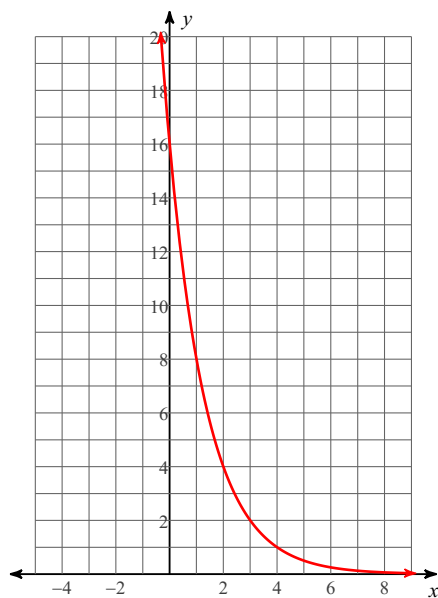
4) $y = 5 \cdot \left(\frac{1}{2}\right)^x - 1$



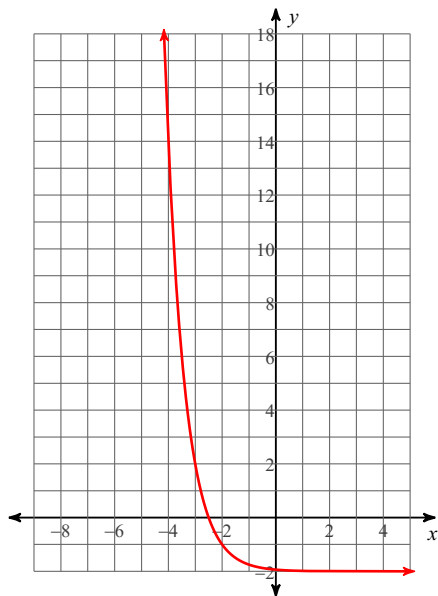
5) $y = \frac{1}{4} \cdot 4^{x+1}$



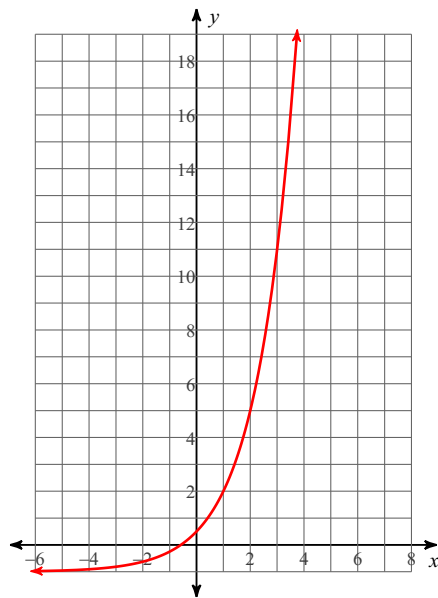
6) $y = 4 \cdot \left(\frac{1}{2}\right)^{x-2}$



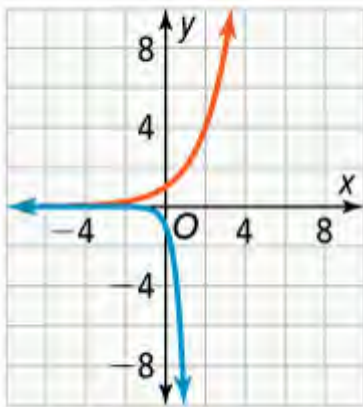
7) $y = \left(\frac{1}{4}\right)^{x+2} - 2$



8) $y = 3 \cdot 2^{x-1} - 1$

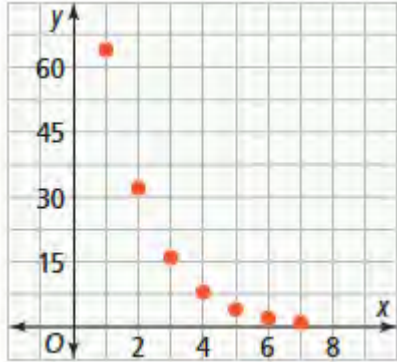


11. The rate is **0.3**, so the decay factor is **$b = 0.7$** .
12. 346,904; This is the population for the first known year of data. The year 2000 acts as 0.
18. growth; $1+1.5$; 1.5; 150%
19. decay; $1 - \frac{2}{5}$; $\frac{2}{5}$; 40%
20. decay, $1 - \frac{7}{10}$; $\frac{7}{10}$; 70%
21. growth, $1+1$; 1; 100%
22. 10.8; 17.8
23. $g(x) = -6(2)^x$



24. $f(x) = 4,007(0.9964)^x$; 3,728
25. $P(t) = 50(4)^x$; 51,200 bacteria

- 26.
- decay
 - the initial number of teams in the tournament
 - 50%; The rate of decay is $\frac{1}{2}$.
 - reasonable domain: $\{1, 2, 3, 4, 5, 6, 7\}$; range: $\{1, 2, 4, 8, 16, 32, 64\}$;
The function only makes sense for 7 rounds. After the seventh round, there is only one team remaining.



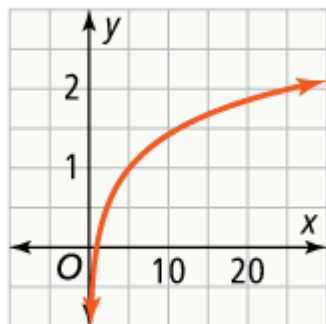
- 30.
- $A = A_0 \left(\frac{1}{2} \right)^{\frac{t}{21.5}}$
 - about 143 hours

- 12. The student compounded the interest monthly instead of quarterly. $A = \$7,935.16$
- 16. \$1,367.31
- 17. \$7,543.88
- 18. \$4,469.79
- 19. \$1,716.79
- 20. \$1,150.27
- 21. \$43,492.51
- 23. $y = 53.0(1.082)^x$
- 27. Jacinta; Continuously compounded interest increases at a faster rate.
- 29. \$4,905.04; \$1,405.04
- 31. B, D
- 32. C

14. The student did not convert to logarithmic form correctly. The solution should be $t = \ln 6.125$.
23. $\log_3 6561 = 8$
24. $\ln 0.0498 \approx -3$
25. $\log_5 1 = 0$
26. $\log_7 343 = 3$
27. $10^{-2} = \frac{1}{100}$
28. $8^2 = 64$
29. $e^5 \approx 148.41$
30. $2^{-5} = \frac{1}{32}$
31. -3
33. 4
35. 3
37. undefined
39. 1.8949
41. undefined
43. 1.0792
45. 142
47. 2.7964
49. 2.8904
51. about 22 years
52. Peter's account
56. C

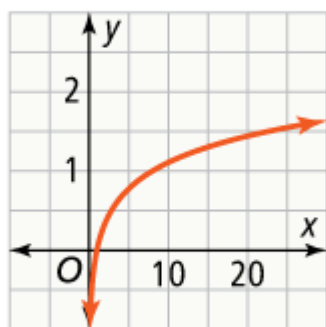
8. $g(x)$ is shifted 7 units to the right.
9. The student added 6 to the logarithmic term, but the 6 should have been added as a separate term. The correct inverse function is $f^{-1}(x) = \log_5(x - 2) + 6$.

12.



domain: $\{x \mid x > 0\}$; range: all real numbers; intercept: x-intercept 1;
 asymptote: y-axis; end behavior: As $x \rightarrow 0$, $y \rightarrow -\infty$. As $x \rightarrow \infty$, $y \rightarrow \infty$.

13.



domain: $\{x \mid x > 0\}$; range: all real numbers; x-intercept: 1; asymptote: y-axis;
 As $x \rightarrow 0$, $y \rightarrow -\infty$. As $x \rightarrow \infty$, $y \rightarrow \infty$.

16. vertical shrink of $\frac{1}{2}$; asymptote: y-axis (same as parent function); x-intercept: 1 (same as parent function)
18. reflection of $f(x)$ shifted 0.5 units to the left
19. $f^{-1}(x) = \log_5 x + 3$

21. $f^{-1}(x) = \log_6 x - 7$

22. $f^{-1}(x) = \frac{2^x}{8}$

23. $f^{-1}(x) = e^{x+1} - 3$

26. 0.07; 0.05

30. B

11. The student used 2 as an exponent instead of $\frac{1}{2}$. The correct expression is $\log_3 2y^{\frac{1}{2}}$.
12. The student applied the Change of Base Property incorrectly and used natural logarithms instead of common logarithms.
15. $\log_6 2 + 5\log_6 m + 3\log_6 n$
17. $\log_2 x - \log_2 5 - \log_2 y$
19. $\log_5 \left(6y^{\frac{1}{2}} \right)$
21. $\ln \left(\frac{3}{8y^3} \right)$
23.
$$\begin{aligned} pH &= \log \frac{1}{[H^+]} \\ &= \log 1 - \log[H^+] \\ &= 0 - \log[H^+] \\ &= -\log[H^+] \end{aligned}$$
25. 0.898
27. 2.807
29. 3.135
31. $\frac{\log 11}{\log 5}; 1.490$
33. $\frac{\log 30}{\log 2}; 4.907$
35. $\frac{\log 55}{\log 4}; 2.891$
39. D

12. addition, Product Property of Logarithms, Property of Equality for Logarithmic Equations, expansion, subtraction, factoring; Both solutions are correct, but -1 is extraneous.
15. -5 is extraneous
17. 0.6833
19. -0.4286
22. 1.4406
24. -0.5638
27. 7
28. about **9.16%**
29. -1 ; 5
33. 1.266, -2.766 is extraneous.
35. 4, -1 is extraneous.
37. Both 1.303 and -2.303 are extraneous.
41. 2,045