

Math 131 Week in Review
Sections 1.5-1.6, 2.1
0/31/10

1. Use the laws of exponents to simplify each of the following:

(a) $\frac{(6x^2y^5)^3}{\sqrt[3]{x}}$

(b) $(a^{n-1} b^2)^{n+1}$

2. Explain the relationship between the graphs of the functions below:

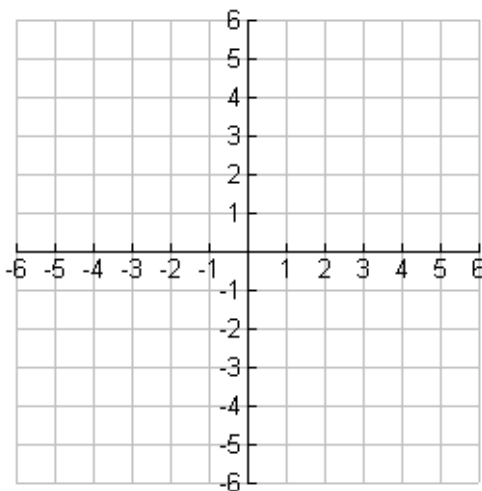
$y = 3^x$

$y = 6^x$

$y = 15^x$

$y = e^x$

3. Starting with the graph of $f(x) = e^x$, write the function g , resulting from reflecting the graph about the line $y = 2$ and translating right 3 units. Sketch the graphs of f and g .



4. Find the domain of each function.

a. $f(x) = \frac{1}{\sqrt{1-2^x}}$

b. $g(x) = \frac{1+2x}{1-e^{1-x^2}}$

5. The half-life of sodium-24, ^{24}Na , is 15 hours.

(a) If a sample has a mass of 30 mg, find the amount remaining after 45 hours.

(b) Find the amount remaining after t hours.

(c) Estimate the amount remaining after 2 days.

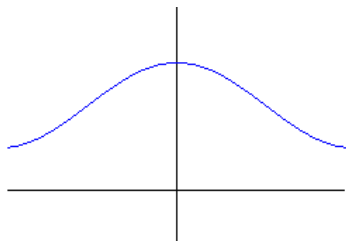
(d) Estimate the time required for the mass to be reduced to 2 mg.

6. Determine whether the following functions are one-to-one.

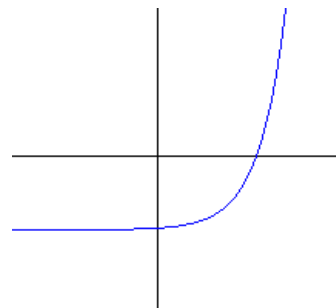
(a) $f(x) = x^2 + 3x - 2$

(b) $g(x) = 1/x$

(c)



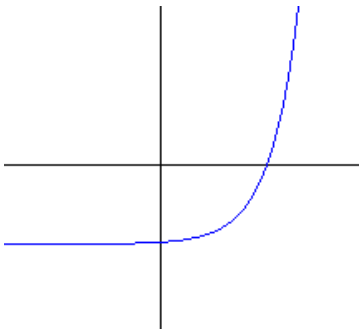
(d)



7. Find the inverse of $g(x) = \frac{2x+1}{3x-4}$.

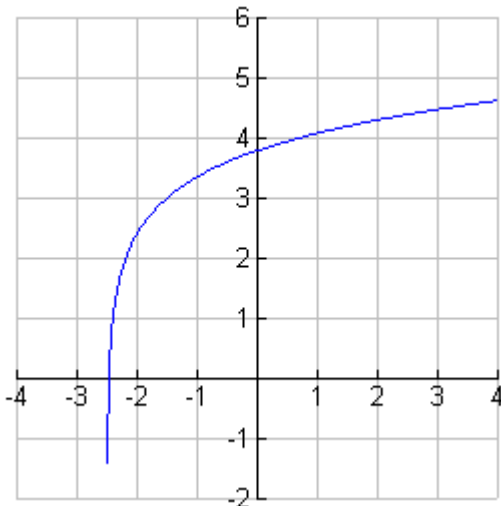
8. Find the inverse of $h(x) = \ln(x-2) + 1$.

9. Sketch the inverse of the function graphed below.



10. If $f(x) = x^2 - 3x + 1$, find $f^{-1}(1)$ and $f^{-1}(-1)$.

11. The graph of f is given.



a. What are the domain and range of f^{-1} ?

b. Estimate the value of $f^{-1}(3)$.

c. Estimate the value of $f^{-1}(0)$.

12. Find the inverse of $f(x) = \frac{e^x}{1-2e^x}$.

13. Find the exact value of each of the following.

(a) $2\log_6 36$

(b) $\ln \frac{1}{e}$

(c) $\log \sqrt[3]{10}$

14. Express as a single logarithm: $\log_2 \sin x + \log_2 (x+3) - \frac{1}{2} \log_2 5$

15. Solve for x: $\ln x - \ln (x+2) = 1$

16. Solve for x: $e^{2x} + 3e^x = 10$

17. Solve for x: $e^{2x-3} > 5$

18. The table shows the position of a walker.

t (seconds)	0	1	2	3	4	5
d (yards)	0	2.5	6.5	9.5	12	15.5

Find the average velocity for each time period:

(a) $[1, 3]$

(b) $[2, 3]$

(c) $[3, 4]$